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CONTENTS:

Editorials (For Titles See Extended Table of Contents).. 97

ORIGINAL ARTICLES

Newer Clinical Concepts of Blood. *J. W. Sours, M. D., Peoria, Ill*.... 109
Use of Bichloracetic Acid in Surgery. *Edward H. Ochsner, M. D., Chicago*.... 115
Cost of Medical Education Re Cost of Medical Care. *I. H. Neece, M. D., Decatur, Ill*.... 118
Manipulation of the Stiff Shoulder. *John D. Ellis, M. D., Chicago*.... 121
New Phases in Pediatric Medicine. *Clifford G. Grulee, M. D., Chicago*.... 130
Legislation in the Interest of Veterans. *H. H. Shoulders, M. D. Nashville, Tenn*.... 136
Urinary Antisepsis—New Product for Oral Use. *Dorrin F. Rudnick, M. D., Chicago*.... 144
Phrenico-Exeresis in Treatment of Pulmonary Tuberculosis. *Otto C. Schlack, M. D., and Jerome R. Head, M. D., Chicago*.... 151
Schilling Count as an Aid in General Surgery. *H. P. Miller, M. D., Rock Island, Ill*.... 156
Retropharyngeal Abscess. *P. J. Sarma, M. D., Chicago*. 16.
Prostatic Massage. Facts and Fallacies. *Leon M. Beilin, M. D., Chicago*.... 164
Traumatic Rupture of the Spleen. *Maurice S. Mazel, M. D., Chicago*.... 170
Goiter in Pregnancy. *L. E. Day, M. D., Chicago*.... 173

(Continued on Page 8)

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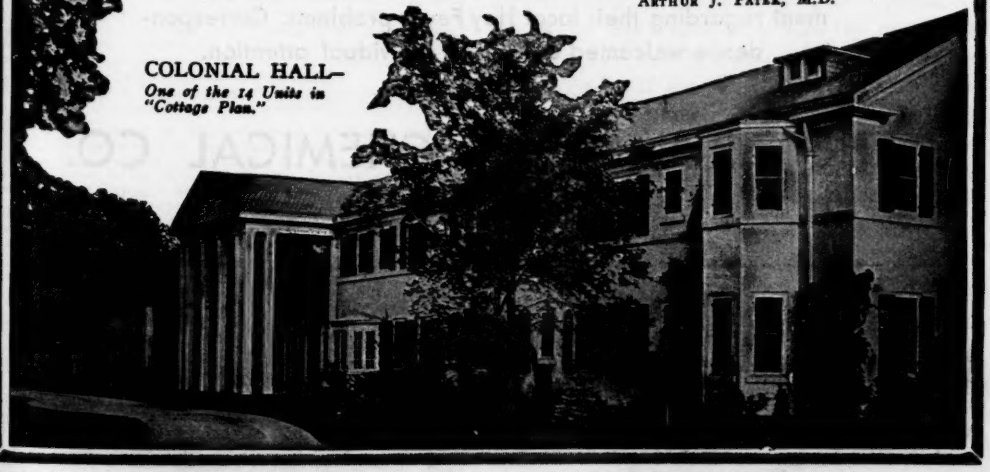

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THE OFFICIAL ORGAN OF

THE ILLINOIS STATE MEDICAL SOCIETY

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Editorials

AUTOCRACY OF THE SICK ROOM HAS BECOME VESTED IN THE DESPOTIC REALM OF THE NURSE.

The nursing problem is becoming increasingly an example of the frequent paradox that where illness is concerned the "cure is worse than the disease."

As an example of efficiency "hoist by its own petard" the trained nurse situation is one of the most appalling. The medical profession views this Frankenstein of its own manufacture with positive unbelief.

Autocracy of the sick room has become vested in the despotic realm of the nurse who has become a positive czar and who is as luxurious an expense as any Romanoff ever dared to be. Sickness is an expense that no family budget can afford to carry under the best of circumstances but under the present conditions insisted upon by a trained nurse before she will accept a case, the employment of such assistance in illness become enough to actually bankrupt a family.

The registered nurse situation today illustrates perfectly the process of refusing to render service in accordance with hire received. The shift system being forced upon the public makes the patient of less importance than the number of hours a day that a nurse stays under the patient's roof. If the patient is dying of typhoid for example a nurse puts in no more time than if the case is a neurasthenic and vice versa. Nurses are demanding the same hire and the same consideration out on a case where the actual nursing duties—many of these not at all menial—require two hours per day. Take for example a case of fatty heart in some degenerative disease where the patient's cumulative chronic condition demands the presence of a trained caretaker, even though the duties are simple, what the present movement tends to insure would be that such a patient should have a shift of three nurses per day each at the rate of fifty dollars a week and board. This is a

case of reductio ad absurdum of liberality in the care of the sick. Any doctor who put in a fee of $150 per week and board for the care of such a case would be accounted a brigand. Yet this discounting of wisdom, skill and directive science upon the part of the physician is made a weapon of argument by the already over-trained and over authoritative nurse in her fight for the greatest pay and the least service. The ranks of the nursing profession have held and do hold thousands and thousands of heroic and unselfish women, who undoubtedly have been at the mercy of overbearing patients but the present crusade is basically wrong.

POORLY SELECTED CHARITY IS WORSE THAN NONE — A PERIL RATHER THAN A PHILANTHROPY.

"And the greatest of these is charity!"

But there's no philanthropy in sending dancing shoes to a cripple or blooms to a blind man.

Quite in line is the misdirected benefaction of wealthy, kind-hearted persons, who with all the generosity of those highly impressionable nervous systems frequently prevalent among the wealthy laity let their nerves and their hearts get the better of their sense of justice, economics, and essential need.

When such a mishap occurs what do we find in their midst?

Only too often there occurs a "medical institute" or a "free health center" for all sorts of patients, whether these be needy and unable to pay or rich and parsimonious.

Noble in purpose as may be these endeavors on the part of the ill-advised laity, Heaven knows their results are often over productive of exactly the opposite of what was intended. Instead of helping the destitute poor to rise to better stations such ill-advised charities tend to submerge the self-respecting poor into the path and swamps that lead to pauperization.

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IMPRISONMENT MANY TIMES MORE COSTLY THAN PROBATION

Maude G. Palmer, Illinois State Probation officer in "Welfare Bulletin" July, 1932, under the caption Does Probation Pay in Dollars and Cents? says:

"Some very significant facts have been brought out recently in reports published in Massachusetts and New York concerning the economic aspects of probation service. While the trained and practical worker in the field of probation, as well as the student of sociology, is fully aware of the value of probation service from the humanitarian point of view, and feels that its costs are more than compensated by its results, the ordinary citizen and taxpayer need more convincing arguments.

"In these days of excessive taxation and high cost of government, people have a right to demand and to secure economies in public service. It is no economy to go on building bigger prisons and reformatories, to add more cells to those we already have, and to increase our parole divisions. True economy would be shown in extending probation service into every section of the state, through both county and circuit courts, and for the state to support and encourage its use in every possible way.

"Probation costs, on the average, about one-tenth as much as imprisonment.

"Those who are skeptical about the value of probation are probably those who have lived in communities where it has been given carelessly and unwisely; where there has not been proper investigation of the offender before granting probation and proper supervision of him afterwards.

"England, Holland, Massachusetts and New York are outstanding examples of what probation does when properly financed and administered. What is helping to close the prisons in England? Probation. What has closed five prisons in Massachusetts in the last few years? Probation. The crime rate has continued to decrease in these places.

"A report from the adult probation depart-

ment of Monroe county, N. Y., states that, 'in the first place, probation is essentially a *state function and obligation* as much as prisons are. It is not a matter for local administrations to determine exclusively. Neither should the entire cost be borne locally. Crime is well organized, and not a local matter. The departments for the suppression of crime should be at least as well organized and universal in their administration, and as well financed, as crime has proved itself to be.'

"The report from Massachusetts states that, 'the demand is emphatic for the state government's direction or supervision of the service, an end to be reached without impairment of the localized initiative and contribution.'

"More persons, 34,304 to be exact, were placed on probation in Massachusetts during the year ending September, 1930, than in any previous year. The total cost of this service for the year was $614,480.18 or $17.91 per capita, per year. It included payment by the counties for salaries and expenses of probation officers, and by the state for those of the board's office. Collections from probationers amounted to over $2,000,000, leaving a net profit of $1,475,300.50.

"To this sum must be added the amount saved the taxpayers for the cost of institutional care of such portion of these offenders as, under the old order would be imprisoned, and the care of their families, most of whom would have been a public charge.

"The New York report shows that imprisonment in that state costs nineteen times as much as probation and that the cost of the construction, per inmate, of the new Attica prison will be $5,000. The total cost of the adult probation department of Monroe county for each case under supervision in 1930 was $56.10. Therefore the sum of $5,000 would have taken care of nearly 90 people on probation."

$125,000,000 SPENT ANNUALLY ON HEALING CULTS IN UNITED STATES.

The Committee on the Cost of Medical Care says: Approximately $125,000,000 annually, equivalent to 12 per cent. of the amount spent on the 142,000 doctors of medicine, is expended in the United States on 36,150 other practitioners who hold themselves out to treat the sick—osteopaths, chiropractors, naturopaths and allied healers, and Christian Science and New Thought practitioners—according to Louis S. Reed, Ph.D., in a report presented to the Committee on the Costs of Medical Care, yesterday (Sunday, May 1).

Present legislation designed to protect the public from unqualified practitioners is not accomplishing its purpose, according to the report, for, although it maintains high standards for doctors of medicine, it sanctions the existence on a lower plane of qualifications of thousands of poorly trained practitioners. The use of any therapeutic measures by untrained or poorly trained individuals, unable to diagnose disease and unaware of their limitations, is unsound, dangerous and wasteful, no matter how sound those measures may be, Mr. Reed said.

The report stated that, while religious healing is able to accomplish beneficial results in some conditions, it may be harmful when practiced by those unable to diagnose disease, especially when it is held that disease is an illusion.

Mr. Reed's report, "The Healing Cults," published by the University of Chicago Press, is the sixteenth study completed by the Committee on the Costs of Medical Care which, on November 29, will issue its final report with recommendations based on its exhaustive five-year study of the problem of "the delivery of adequate, scientific medical service to all the people, rich and poor, at a cost which can be reasonably met by them in their respective stations in life."

As a result of his exhaustive study, Mr. Reed estimated that the people of the United States annually spend $42,000,000 for the services of the nation's 7,650 osteopaths; $33,000,000 on 16,000 chiropractors; $10,000,000 on 2,500 naturopaths and allied groups; and another $10,000,000 on the 10,000 Christian Science and New Thought healers.

A study of 7,800 representative families revealed that only 52 families considered healers in these cults as their family practitioners. Only 1.3 per cent. of the families having medical care during the year used them exclusively, although 10 per cent. resorted to healing cult practitioners at one time or another.

Cultist Schools Found Weak. The report traces the development and history of the various cults and contains descriptions of the schools, ideas and legal status of each group. It points out the similarity in the origin of many of the

cults, in that originally their treatments were "cure-alls" based on all inclusive theories of the cause of disease. Modification of such theories and the elevation of professional and educational standards gradually leads the cult to improve in training and diminish in number and eventually to be assimilated into the general body of regular medical practitioners, according to the report.

Mr. Reed condemned the quality of teaching in the chiropractic and naturopathic schools. He found that entrance requirements are lax, equipment is poor, and none makes adequate hospital clinical facilities available to its students, while faculties are largely composed of persons ignorant of the established facts of medicine. At the completion of the regular course in one school, the report reveals, the student receives four diplomas and becomes a Doctor of Chiropractic, a Doctor of Naturopathy, a Doctor of Physiotherapy and a Master of Physical Culture.

Why Do the Cults Exist? In explaining the prevalence of healing cults Mr. Reed stated that, "The idea of healing the sick, and being a 'doctor' with all that the title entails, is very attractive to many people, but this field of economic endeavor is closed to many by reason of the very high qualifications which the law requires of medical practitioners. Healing cults, therefore, provide a short cut for those who lack time, money or mental capacity to attain the qualifications demanded of the medical profession."

Mr. Reed gave some of the reasons why the public patronized healing cults practitioners:

1. Because of inattention by some medical practitioners to minor illnesses and to ailments of the mind.

2. Because doctors cannot cure all diseases and those who have failed to obtain help from regular doctors feel that little is lost by trying the "irregulars."

3. Because many people are still basically superstitious about disease and health. They know little about the body and its functioning. They regard medicine neither as science nor art but as magic. To these the healing cult practitioner, with his simple explanation of disease, his confidence and his promise of cure, appears as a greater magician than the physician whose very knowledge makes him hesitate to promise a cure.

4. Because many patients are unaware of the limitations of the healing cult practitioners whom they consult, since they do not understand the meaning of D.O., D.C., N.D., and other titles of the various practitioners indiscriminately called "doctor." The reputation of healing cult practitioners is sustained by the fact that in acute diseases 80 to 90 per cent. of all patients get well under any treatment or none. And when a patient gets well his recovery is attributed to the virtues of the treatment.

Makes Recommendations Regarding the Cults. Mr. Reed pointed out the following ways in which the situation with regard to the healing cults can be improved:

The lay community's stock of knowledge regarding the human body and its functioning must be enlarged and more widely disseminated. As a result, for each succeeding generation, the limits within which credulity exists and unscientific practitioners can operate will be narrowed.

The passage by more states of basic science laws may be expected to cut down the inflow of poorly trained practitioners. These laws, already in existence in some states, require that all applicants for licenses to practice any branch of the healing art must first pass an examination in the basic sciences. The state should see that healing practitioners, whatsoever their beliefs, are properly trained and that they possess an adequate knowledge of the human body and its functioning and the diseases which afflict it.

VOLUNTARY INSURANCE MAY POSSIBLY CHANGE TO COMPULSORY INSURANCE—THE POSSIBLE ADVENT OF STATE MEDICINE IS BY NO MEANS A NEW THOUGHT.

Dr. Henry O. Reik, the editor of the *New Jersey Medical Journal,* has published (in several editions of his journal) a series of articles entitled "Medical Travel Talk." The articles are based on a personal survey of medical economic conditions abroad. In the May, 1931, issue of his Journal he offers a survey of home economic conditions. We quote:

"And now, at last, we return from this theoretic voyage to foreign countries and are confronted by conditions at home which seem to demand some consideration with relation to the

necessity for opposing, or accepting and guiding, state health insurance—otherwise known as State Medicine. As has been pointed out, nearly every other nation on earth has either voluntary or compulsory health insurance for those citizens who earn less than $1,200 a year; and it seems highly probable that the few nations yet depending upon *voluntary* insurance will change to the *compulsory* form within the next few years. The possible advent of state medicine into some one of our states is by no means a new thought; its coming has been repeatedly predicted, promised or threatened. It does, however, seem to be at this moment more imminent than ever before; an opinion based upon the fact previously referred to, i. e., that throughout our country those who are most closely in touch with current events believe that state medicine is due to arrive shortly unless the profession can forestall it by supplying something in lieu thereof—some improvement on present methods that will satisfy the demand for better and cheaper service to the mass of citizenry.

"In support of that opinion let us remind you that for the third successive year the Legislature of Massachusetts has been presented with an Act to create a department of public medicine and health for the purpose of furnishing a free and complete medical service to the people of the commonwealth of Massachusetts, patterned upon the bureau of medicine and surgery of the United States Navy.

"That Act will probably not become a law this year but it is a noteworthy fact that each year it has gained in the number of adherents despite determined opposition on the part of the medical profession; and its author tells us he is encouraged to believe it will ultimately be adopted. Further, we may direct your attention to an Act now pending in the New York Legislature: an Act which covers the entire field of health insurance, unemployment insurance and old age pensions. Again, we feel certain this proposition will be defeated this year; but, what about next year or the year following? These are but single instances but they may be considered as very definite indications of the direction of the wind; and they are of special import because they have appeared in two of the most conservative and most important states in the Union, and because neither Act emanated from a "radical" source; one was drawn by a thoroughly reputable physician, and the other was sponsored by a legislator in good standing—whether or not aided by a physician we do not know.

"On our desk there are 28 original articles that appeared in state medical society Journals between May and October, 1930, articles not searched for but which were observed in the routine course of inspecting the tables of contents as exchange copies passed through our hands, all dealing with this question of prospective state medicine. Among the authors of those articles we note three ex-presidents of the American Medical Association; seven presidents of state societies; two presidents of county societies; and the others are all men of prominence in the profession, no "reds," no paid writers, no one "with an axe to grind"—but each and everyone speaking in the interest of his medical confréres. We may add, too, that these writers represent all sections of the nation from Maine to California—including, as it happens, both those states.

"We will not bore you now with lengthy abstracts from those articles, but to show that there is no material difference of opinion between physicians of the east and the west, the north and the south who are awake to the situation, and that there is among them a universal demand for preparedness, let us refer briefly to three or four articles arising from widely separated points.

"Dr. S. H. Boyer, President of the Minnesota Medical Society, said: 'What the attitude of the medical profession shall be in relation to the changes taking place affords food for serious thought. That paternalistic encroachments have taken place is only too apparent. * * * The movement appears to be well nigh world-wide in its scope and its tentacles are reaching hungrily into our own country. It has gathered such impetus now that only a solidly organized and militant profession will be able to ward it off or so modify it as to eliminate its most pernicious features.'

"At the Annual Meeting of the California Medical Association, April 28, 1930, the Chairman of the Committee on Medical Economics, reporting to the House of Delegates, deprecated the lassitude of the major portion of the organization and scolded them for scant courtesy

shown another member who had spent two years in study and preparation of a report upon economics conditions. In consequence, in July issue of the State Society Journal (*California and Western Medicine*) you will find three excellent papers by Drs. Rexwald Brown, of Santa Barbara, John H. Graves, of San Francisco, and John C. Ruddock, of Los Angeles, reviewing the whole subject.

"W. G. Richards, of Billings, Montana, says: 'The danger of our present attitude is that while we stand off and quibble the public may take the matter into its own hands and impose upon us some scheme of its own devising.'

"C. A. Harper, President of the Wisconsin Society, says: 'These facts strongly emphasize a popular demand for certain changes that will comply, more or less, with the wishes of the general public. Is it wise for the medical profession to remain indifferent to the problem while these agencies are developing certain lines of activity, or would it not be far better for the medical profession to appreciate the evolution that is now taking place, and become a prominent factor in guiding these various lines of procedure?'

"From the *New York State Journal of Medicine* (Dec. 1, 1930, page 1424) we quote part of an editorial written by Dr. William H. Ross, President of the New York State Medical Society, referring to the program of the Annual Conference of State Society Secretaries: 'It indicates that the day of isolation in medicine is over and that medicine must soon undertake a self-appraisal of its own organization to see if its own public medical relationships are such as to enable it to make proposals for the solution of unsolved and unmet public medical service problems, chiefly just two —the availability of medical knowledge for limiting illness, and provision for adequate medical care at a cost that can be met without involving the individual in debt from which he can hardly ever recover. It is the obligation of medicine to propose methods for these things, and, also, to work out a solution of how the doctor may be paid for his services to the indigent or near indigent, either in private practice or hospital. * * * There may come another revolution in medical practice, as it has come in the past, as the result of great social needs and social changes; and who knows that it is beginning? We may be nearer than we know to such things as unlimited old age pensions, provision for adequate medical care by the state, and the inclusion of sickness benefit in Workmen's Compensation and Health Insurance as in other countries. It should make us think?'

"THESE THINGS 'SHOULD MAKE US THINK.'

"That is the note upon which we would close this series of letters."

COMPARATIVE COST OF MEDICINES UNDER PROPRIETARY AND CHEMICAL NAMES

The Medical Society of New Jersey, March, 1932, calls attention to the comparative cost of medicines under proprietary and chemical names. We quote:

"PAYING—Extravagantly—for a name" is the title of a timely editorial in *The Journal of the Medical Society of New Jersey* for March. In it attention is called to the thoughtlessness or ignorance of physicians in prescribing proprietary preparations about which they know little or nothing, or in prescribing proprietary preparations under a trade-marked name, at an exorbitant price, when the same preparations under a chemical name are listed in New and Nonofficial Remedies and can be obtained for very much less. As an example, a comparison is made in the relative prices of twelve substances, in quantities of one ounce each, under the proprietary and chemical names, respectively, and the market prices of each. The list is as follows:

Proprietary—	Price 1 oz.
Phenacetin	$0.63
Aspirin Bayer	.85
Veronal	3.00
Atophan	2.75
Duotal	1.07
Urotropin	.60
Tolysin	2.25
Luminal (in ½ oz. carton)	6.90
Trional	1.90
Sulphonal	1.70
Diuretin	1.85
Aristol	1.80
	$25.30

Chemical—	Price 1 oz.
Acetphenetidin	$0.20
Acetylsalicylic acid	.15
Barbital	.70
Cinchophen	.35
Guaiacol carbonate	.27
Methenamine	.13
Neocinchophen	.97

Phenobarbital	1.75
Sulphonethylemethane	.50
Sulphonmethane	.40
Theobromine sodium salicylate	.80
Thymol iodid	.68
	$6.40

Under its patented name, each drug will cost approximately four times as much as when purchased under its proper laboratory name. The pharmacist is not to blame, because he is, professionally, in honor bound to supply the *exact thing* prescribed—and dare not substitute. It is a point which deserves some thought with regard to these and a few other preparations which are extensively advertised.

ATTEMPTED LEGISLATION TOWARD INSURING PAYMENT OF HOSPITAL BILLS

According to the A. M. A. Association Bulletin, bills were considered in Delaware,[380] *Illinois,*[381] Indiana,[382] Iowa,[383] Maine,[384] Massachusetts,[385] Montana,[386] New York,[387] Oregon,[388] South Carolina,[389] Tennessee,[390] Texas[391] and Utah[392] to give hospitals treating persons injured in accidents liens on any judgments, settlements and compromises obtained by such injured persons by reason of their injuries. Such bills were enacted in Delaware,[393] Montana[394] and Oregon.[395] The hospital lien law in New Jersey was amended by two enacted bills. One bill[396] gives such liens to all hospitals, while the prior law gave it to charitable hospitals only. The other enacted bill[397] establishes a procedure to cancel hospital lien notices on file with county clerks, when the hospital bills have been satisfied. Bills were considered in Georgia[398] and North Carolina[399] to make it a misdemeanor for any person to obtain credit fraudulently from any hospital. Only the North Carolina bill became a law. The legislature of Oklahoma[400] killed a bill proposing (1) that hospitals have liens on patients' property brought into the hospitals, for charges due for hospital fees, nursing, medical and professional services, and (2) that it should be a misdemeanor for any person to obtain hospital service with intent to defraud the hospital of payment.

Hospital Nurses. A defeated Indiana bill[401] proposed to prohibit the employment of nurses in hospitals longer than eight hours a day, except in emergencies.

Exemption from Taxation. Attempts in Maryland, Pennsylvania and Oklahoma to exempt, to a limited extent, private hospitals from taxation were unsuccessful. The Oklahoma bill[402] proposed to exempt from taxation hospitals 10 per cent. or more of whose cases were charity cases. The Pennsylvania bill[403] proposed to accord such exemption to hospitals conducted by corporations not for profit or by other purely charitable associations from which no profit is derived.

376. Ill. H. 852.
377. Colo. H. 78.
378. Conn. S. 127.
379. Conn. S. 333.
380. Del. S. 116.
381. Ill. S. 610.
382. Ind. H. 11 and H. 219.
383. Ia. H. 128.
384. Me. H. 970.
385. Mass. H. 494.
386. Mont. H. 102.
387. N. Y. S. 1596 and A. 2004.
388. Ore. H. 202 and H. 400.
389. S. C. H. 549.
390. Tenn. H. 514.
391. Tex. S. 488, S. 182 and H. 315.
392. Utah. S. 48.
393. Laws of Del., 1931, Chapter ——, introduced as S. 116.
394. Laws of Mont., 1931, Chapter 57, introduced as H. 102.
395. Laws of Ore., 1931, Chapter 111, introduced as H. 400.
396. Laws of N. J., 1931, Chapter 231, introduced as S. 161.
397. Laws of N. J., 1931, Chapter 153, introduced as A. 63.
398. Ga. H. 389.
399. Public Laws of N. C., 1931, Chapter 214, introduced as S. 450.
400. Okla. S. 232.
401. Ind. S. 324.
402. Okla. S. 250.
403. Pa. S. 773.

QUALITY OF MEDICAL SERVICES DETERIORATE UNDER COMPULSORY HEALTH INSURANCE*

(Continued)

Some fifteen years ago when the prices of eggs and chicken feed were at their highest, I wrote my farmer and asked him why he was not sending us any eggs. I received the following laconic answer: "The pullets look good but lay no eggs." Superficially examined, Compulsory Health Insurance "looks good" but unlike my pullets it has laid many eggs, most of which are addled.

When we substitute governmental control in medicine and dentistry for independent individ-

*Seventh installment of Dr. Edward H. Ochsner's articles on Medical Economics.

ual action, we stifle self-expression, individuality, initiative, courage, confidence, enthusiasm and industry. We, as a nation, are on the whole already over-standardized. The very ones who wail the loudest about the evils of mechanization are often the very ones who clamor the most for more government control. Excessive bureaucratic and lay control have much the same spiritual effect upon the professional man as over-mechanization has upon the intelligent craftsman. They both have a tendency to crush out fortitude, ingenuity and pride of achievement in those engaged in these vocations. With some, standardization has become almost a fetish in spite of the fact that when pushed too far it always results in mediocrity. The efficient successful practice of medicine always has been and always will be a personal unstandardized affair.

That the quality of medical services has deteriorated in those countries which have Compulsory Health Insurance is due to many causes among which may be mentioned the excessive number of calls upon the time and energy of the physician. Those who receive free medical services are constantly running to the physician for every trifling ailment or compelling the physician to make many unnecessary calls at the homes. Every Krankenkasse physician who has been interviewed has stressed this fact. Baeumer states in his book that between sixty-five and seventy per cent of all calls are unnecessary, consume the time and energy of the physician and the resources of the Krankenkasse, and prevent adequate medical services and hospital care to the really sick. Liek in his book says the number of trivial conditions such as "microscopic skin abrasions, etc." disgusted him so much that he retired from the service. This abuse has grown to such proportions in Germany that the government department has been compelled to issue new regulations to the effect that the insured have to pay a certain fee out of their own pockets for each prescription. This again has given rise to new abuses. A common sequence of new regulations to correct one abuse is to create an opportunity for newer ones. In England unnecessary night calls became so common that many panel physicians disconnected their phones between ten o'clock P. M. and seven o'clock A. M. A fine state of affairs if a patient has a strangulated hernia or an attack of gall stones, of acute appendicitis at midnight! We have all repeatedly seen and heard the statement that the workers of this country do not have medical services when they most need them—namely, at the beginning of an illness. The claim is made that were prompt services available at this time much serious illness could be avoided. Conclusive proof that private practice is more prompt than Compulsory Health Insurance practice is evidenced by the practice in England of avoiding night calls, and by the fact that the percentage of pus appendix cases, which necessitate draining, is much greater in Germany than in the United States. We all know how the mortality rate is increased by letting acute appendix cases progress to suppuration before they are operated on and how much longer the period of hospitalization is in suppurative cases. If acute illnesses had more prompt and more efficient treatment in Germany, for instance, than in the United States, suppurative appendix cases should be much less frequent, the mortality rate should be lower and the morbidity shortened. As a matter of fact, the reverse is the case which proves rather conclusively that medical services in the United States are more efficient than those in Germany. Such abuses result in endless rules and regulations. Rules that accomplish little except to cramp the individuality and personality of the conscientious physician, wear him out with paper work and leave little time and energy for professional study and advancement. One official described his plight in the following words:

"I've settled into official routine; I'm fixed there hard and fast. It's so with many of us. Most of us recognize the hopelessness of ever pulling out. As I sometimes confess, I am merely one of the unburied dead."

That Compulsory Health Insurance does not in fact prevent sickness nor reduce economic loss as the result of sickness is also proved by the following facts. Before the World War the average loss of time for sickness of the American laboring man was six and two-tenths (6.2) days per year; the German's, nine and two-tenths (9.2) days; the Austrian's, nine and five-tenths (9.5). We are credibly informed that since 1923 the loss of time in Germany has increased another eighty per cent. above the nine and two-tenths (9.2) so that it now stands at approximately sixteen and five-tenths (16.5) as against six and two-tenths (6.2) in America. A fine

showing for Compulsory Health Insurance after forty-eight years of operation!

Let us see what some of the German and English think about the scheme. A high salaried German health insurance official said the following in 1927: "Health insurance is the oldest branch of German Social Insurance. The sickness insurance law of June 15, 1883, was the corner-stone of the proud building for which we were envied by foreign nations before the war. Unemployment insurance will, I hope in the near future, be the capstone of the building." To which Edwin Liek, a practicing physician of Danzig makes the following retort: "This is an expression familiar to physicians, words that we have frequently heard during the past four decades. Only now they affect us differently. In the beginning the doctors believed these dulcet tones; today only *parasitic physicians* or *pure fools* join in this festive song." And again he says, "Social insurance is today organized to fill the feed trough of *bureaucratic drones.*" At a recent meeting of the Trade Union Council in Nottingham, England, a resolution was passed unanimously demanding that the Government overhaul the Department of National Health.

That the average American citizen is getting better medical services than are the citizens of those countries which have had Compulsory Health Insurance the longest is borne out by the cited statistics, the quoted opinions as well as by a rather extensive personal experience both in this country and in Central Europe.

(The next two articles will show how Social Insurance undermines national character.)

HOW THE NEW TAX LAW AFFECTS THE PROFESSION.

INCOME TAX—INDIVIDUAL

Normal—4 per cent. of the first $4,000 of net income; 8 per cent. of the remainder.

Surtax—1 per cent. on net incomes in excess of $6,000 to 55 per cent. on net incomes in excess of $1,000,000.

(Exemptions—Single persons $1,000; married person $2,500; credit for each dependent $400. No earned income credit.)

INCOME TAX—CORPORATION

13¾ per cent. on net income.

14½ per cent. on consolidated returns for 1932 and 1933.

(No specific exemption.)

ADDITIONAL ESTATE TAX

1 per cent. on net estates not in excess of $10,000 to 45 per cent. on net estates in excess of $10,000,000.

(Exemption $50,000.)

This tax is in addition to the tax imposed by Section 301 of the Revenue Act of 1926.

GIFT TAX

¾ of 1 per cent. on net gifts not in excess of $10,000 to 33½ per cent. upon net gifts in excess of $10,000,000.

(Exemption $50,000.)

MANUFACTURERS' EXCISE TAXES

Lubricating oils, domestic—4c a gallon.

Brewers' wort—15c a gallon.

Malt, malt syrup, malt extract—3c a pound.

Grape concentrates—20c a gallon.

Imported crude and fuel oil—½c a gallon.

Imported gasoline—2½c a gallon.

Imported lubricating oil—4c a gallon.

Imported paraffin and petroleum wax—1c a pound.

Imported coal and coke—10c per 100 pounds.

Imported lumber—$3.00 per 1,000 feet.

Imported copper—4c a pound.

Tires—2¼c a pound; inner tubes—4c a pound.

Toilet preparations—10 per cent.; dentifrices—5 per cent.

Furs—10 per cent.

Jewelry sold for more than $3—10 per cent.

Automobiles—3 per cent.

Trucks—2 per cent.

Auto parts and accessories—2 per cent.

Radio and phonograph equipment—5 per cent.

Mechanical refrigerators—5 per cent.

Sporting goods—10 per cent.

Firearms, shells and cartridges—10 per cent.

Cameras—10 per cent.

Matches, wood—2c per 1,000; paper ½ of 1 per cent. per 1,000.

Candy—2 per cent.

Chewing gum—2 per cent.

Soft drinks; rates on different beverages range from 1¼c to 6 per gallon.

Electrical energy—3 per cent.

Gasoline—1c per gallon.

MISCELLANEOUS TAXES

Telephone messages, 10c between 50c and $1, 15c between $1 and $2; 20c over $2.

Telegram messages—5 per cent.

Cable and radio messages—10c.

Leased wires—5 per cent.

Admission—1c per 10c for charges over 40c.

Issues of bonds—10c per $100.

Issues of stock 10c per $100 or 10c per share if no par value.

Stock transfers—4c per $100 par or 4c per share no par; 5c per share selling for over $20.

Bond transfers—4c per $100.

Conveyances—50c on $100 to $500; 50c per $500 in excess.

Produce sales for future delivery—5c per $100.

Oil pipe line charges—4 per cent.

Safe deposit box leases—10 per cent.

Checks and drafts—2c each.

Boats—$10 to $200, according to length.

POSTAL RATES

Second class—increase in each of zone rates.

First class—3c.

—*The Detroiter of June* 20, 1932.

RADIO TALKS ARE APPRECIATED BY THE PUBLIC

The following letter came to the office of the Educational Committee the day after the first of a series of talks on "The Evolution of Medicine" was given over radio station WJJD:

"I have just heard the first of Doctor M's talks on 'The Evolution of Medicine,' and wish to take this opportunity to tell you how much I enjoyed it. I shall certainly 'listen in' to the remaining two lectures so as not to miss any part of this interesting story. Your station and the Illinois State Medical Society are to be commended upon presenting such an able and interesting speaker."

HEALTH PROGRAMS FOR LAY GROUPS

The Educational Committee is prepared to schedule hundreds of speakers to present health talks to lay groups. During the last twelve months 518 physicians presented the subject of health to a total of 183,000 people in Illinois. These physicians gave their time, without remuneration, to help in the educational program sponsored by the State Medical Society.

The Committee submits the following suggested topics for health talks:

MEN'S CLUBS

1. Checking Up Your Body's Assets—"The importance of a periodic physical examination."
2. The Business Man and His Stomach.
3. Health Problems in Illinois.
4. Some Health Problems of the Middle Years—"A discussion of the diseases that endanger middle life, as well as of the general health habits to be followed at this time in regard to food, exercise, recreation, rest, etc."
5. How to Be a Great Grandfather—"Periodic Health Examination."
6. Animal Experimentation in Relation to Human Welfare.
7. What Everyone Should Know About Cancer.
8. Mind Health.

WOMEN'S CLUBS AND PARENT TEACHER ASSOCIATIONS

1. Health Problems in Illinois.
2. The Hopeful Side of the Cancer Problem—"A discussion of the nature of cancer and an account of the latest knowledge on the subject."
3. Sound Body—Sane Mind—"A discussion of the intimate relation between muscle and nerve and the necessity for recreational and diversional activities and interests as a counteractant to the intensity of modern life."
4. Growing Old Gracefully—"As women reach middle age, sundry health problems confront them. Cancer, high blood pressure, nephritis, and heart disease need to be guarded against, and the less serious conditions, such as excessive adiposity and the nervous adjustments necessary at this time, should receive attention."
5. Before the Baby Comes.
6. Keeping Children's Diseases Away from Your Children—"A discussion for mothers on how to keep their children well, including food, sleep, clothing, fresh air, cleanliness, etc."
7. The Difficult Process of Growing Up—"Preparing the child for adolescence."
8. How Medical Science Protects the Child.
9. Animal Experimentation in Relation to Human Welfare.
10. The Parent and Child Relationship.

HIGH SCHOOL ASSEMBLIES

1. The Story of X-Ray and Radium—Illustrated with slides.
2. Health and Happiness.
3. Heroes of Health.
4. The Animals Gift to Mankind.

OTHER SUBJECTS MAY BE SUGGESTED

All requests for speakers should be made through the office of the Educational Committee, Illinois State Medical Society, 185 North Wabash Avenue, Chicago, Illinois—TELEPHONE State 4415.

Correspondence

THE MAJORITY OF THE SO-CALLED FREE CLINICS EXIST FOR SELFISH MOTIVES, NOT PHILANTHROPIC

CHICAGO, ILL., JULY 28, 1932

To the Editor: An experiment in connection with the clinic evil.

Affairs have reached such a state, that where at first the word "depression" was tabooed, and anyone who used it was regarded as unpatriotically encouraging a psychological assault on the stability of the country (much like the feeling against the slacker during the war), today the word is tabooed only because it has been so popularly used that we are tired of hearing of it.

Physicians find that a substantial part of their practices are seeking the free clinics; some because they are really unable to pay normal doctor's fees, and some who could afford the regular fees, but are penurious when they find that they can be so without the stigma which formerly attached to the indigents who had to patronize charitable institutions. Some of the most industrious and brightest have been driven to this extremity, and from then it is difficult to distinguish those who are merely penurious. The stigma of failure is gone, and as the topic of conversation broadens out, it is not unusual to find former men of affairs naively giving their intimate financial details to comparative strangers, and even boasting of the amounts lost in the crash. And the next step is to go to the clinic as a lark that does not cost anything, but with the serious purpose of really getting something for nothing, and allowing their penuriousness to overcome their pride.

A few examples will suffice.

Case 1. Young woman patient, single, operating a profitable business of her own, and living with her folks who own their own home, well able to pay, had her tonsils removed free of charge by a well-known specialist at one of Chicago's largest hospitals. She had been treated by me, and informed me that she would have come to me for the operation had she not secured it free.

Case 2. Young woman patient, married, both husband and wife employed and receiving a sufficient salary; soon after being discharged by me from a case of acute tonsillitis, had her tonsils removed free at a large Chicago hospital.

Case 3. Eye patient had been coming to me for perhaps ten years, off and on; employed, but probably without much surplus; attended a Chicago eye clinic where the treatment was free, but the fees for laboratory and medicines far exceeded his bill when he finally came to me for attention.

Case 4. Another eye patient with a somewhat similar experience at the U. of C. clinic, except that they charge him $1.50 per visit. Patient was able to pay reasonable charges.

Originally a doctor's fees were supposed to be an honorarium; he asked nothing, but thankfully accepted voluntary donations from pleased patients. It may not be generally known that there are one or two old time practitioners in Chicago who still have a bowl on the table where grateful patients drop in fifty cents or a dollar, and no bills are rendered. Having this in mind I could hardly quarrel with the doctors who render free service. But I would criticize any clinic which furnished free service without properly investigating the economic ability of the patient to pay. An exceptional few, well-organized charitable clinics in Chicago have field nurses to investigate all patients, and the second treatment is not given if the patient is not a proper subject of charity. Such charities also maintain a clearing house with other charities, by which they prevent duplication of their attentions.

A New York clinic recently reported in the *Journal A. M. A.* a plan to meet the changed economic conditions by furnishing medical services for an annual fee. It included hospitalization for the subscriber and his family, and I believe the annual amount was $100. They secured their members by public talks by staff physicians, and also by newspaper announcements, which was probably proper for the small town, but would hardly do for Chicago. It was decided to experimentally ascertain whether there was any demand for an annual fee in the eye and ear line in Chicago, and my secretary made up a list from my files containing about 100 names, of those patients who had not visited the office for a sufficient length of time to indicate that they were probably seeking attention at free clinics; and this list included a number of patients who still owed for past services. They were offered a year's attention at an annual fee of twenty-five dollars, plus three dol-

lars for each dependent member of their family, the same not to include hospital or laboratory fees. After the lapse of about a month the results were rather discouraging. One patient who wanted the annual arrangement did not have the necessary money, and concluded to pay per visit as before, but insisted that he could only pay one-half the regular fee. Another patient postponed making the arrangement until such time as he actually required the services again, while several, I am convinced, have not even got that annual fee, much as they would like to take advantage of it, and they no doubt attend free clinics. Judging by this experiment, I conclude that no one individual, working single handed, can recall the patients from the clinics. Possibly the medical society as a group could do much towards educating the public that their own doctors are not exacting and will make such concessions in fees as the patient's financial condition may warrant, and that it is neither necessary nor advisable for them to go to a clinic for attention. Further, the Medical Society should bring about the passage of such laws that will require all clinics to employ a visiting nurse or nurses, who will make report, not only on the hygienic surroundings in which the patient lives, but also on the economic ability of each patient to pay.

Undoubtedly the number of patients who are proper subjects for a free clinic has been greatly augmented in the past two years, but nevertheless many are there under misrepresentation, either expressed or implied. The majority of the so-called free clinics exist for selfish motives, not philanthropic. The clinic may be a feeder for the hospital, which may have one free bed to enable it to escape taxation under the law, and which, for the rest, requires payment of all the usual charges whether the case be clinical or private. The clinic also may furnish customers for the sale of drugs and various therapeutic measures, which are charged for, just as the department stores examine eyes free, because they make a good profit merchandising eye glasses. Or the clinic may desire the patients as teaching material for the students. In all these cases, being anxious for the clinical material, they are not too particular about weeding out those who could afford private attention. If the patient is financially able, he is more desirable for the free clinic as a customer for its x-rays and medicines. The clinic would not weed out such patients if they could. Even at our Illinois Charitable Eye and Ear Infirmary there has been no pretense at investigating patients, and I have seen a number with furs and diamonds take the pauper's oath and come for treatment. There are only an exceptionally few of the clinics that really try to weed out those that should pay, and as suggested above, a law should be passed which compelled all clinics to investigate and report under disinterested supervision. Then it would be recognized that medicine is a philanthropic profession only as relates to the indigent, and that otherwise the physician is as justly entitled to pay for his time as the carpenter or bricklayer.

Sol Rosenblatt, M. D.
30 N. Michigan Blvd., Chicago.

SOME PRESSING PROBLEMS IN ALLERGY

J. H. Black, Dallas, Texas (*Journal A. M. A.*, July 2, 1932, points out that in spite of the fact that the treatment of allergic conditions is fairly satisfactory, the fact remains that treatment is largely empiric. Advantage is taken of the fact that allergic persons frequently show skin reactions to their respective allergens to determine the specific allergenic substances, but there are many irregularities found in skin reactivity and the reasons for them are imperfectly understood. Treatment with the substance to which the patient is sensitive frequently produces good results, but there is still much room for argument as to the mechanism underlying the response to treatment. Some of the problems found in an attempt to explain these conditions are due to deficiencies in the knowledge of immunology in general, but some of them may be solved by careful, concerted study by the clinical investigator and the laboratory worker. In this field where animal experimentation may fail to reproduce human reactions, accurate observation of carefully controlled patients may provide the material for the solution of some vexing problems. Of these problems the author discusses the following: (1) basis for hereditary influence; (2) relationship of endocrine organs and involuntary nervous system; (3) relation of reagin to clinical hypersensitiveness; (4) reactivity of the shock organ; (5) local immunity or sensitization; (6) rate of absorption of allergen, and (7) sensitization to nonantigenic substances. These points are raised, not with the intention of disparaging the work which has been done, but to call attention again to the fact that there is a great amount to be done if work in allergy is to be placed on a scientific basis, and to remind the clinician as well as the laboratory worker that careful, painstaking observation may assist in the solution of some of these perplexing problems.

Original Articles

NEWER CLINICAL CONCEPTS OF BLOOD*

J. W. SOURS, M. D.
PEORIA, ILL.

For many years the ordinary leukocyte and differential counts, which have been so valuable as diagnostic aids in the differentiation of diseases, have been regarded as adequate. The differential count has recently been modified by Schilling, who has suggested improvements in the conventional counts. Heretofore, the listing of the proportion of cells from the three great centers of white blood cell origin has been regarded as sufficient. Recent progress in hematology has shown that not only are the relative amount and proportion of white blood cells important, but also the relative age of these cells.

Before taking up the modern aspects of the origin and evolution of these cells, let us review some of the opinions of the past. Ehrlich, the proponent of the "Dualistic" theory, was among the first to show that white blood cells should be classified according to their origin from hemotopoetic organs. He divided them into the cells of the myelogenous system, the granulocytes, and those of the lymphatic system, or agranulocytes. By means of complex stains he was able to work out the ordinary differential count such as we have today. His views were opposed in the beginning by such men as Weidenrich and Maximow, advocates of the "Unitarian" theory, who believed that all white blood cells were derived from the predecessors of the lymphocytes.

It is only until the present work of Schilling and Sabin that the "Unitarian" theory has been disproved. Schilling has also offered proof that the agranulocytic type of cell has two origins; one type, the monocyte, from the reticuloendothelial system of the body; the other, the lymphocyte, from the lymphatic organs. We have, therefore, a transition from the "Unitarian" to the "Dualistic" and finally to the "Trialistic" theory. The Schilling differential count is based on the last theory.

Arneth, in 1904, modified the differential count. The neutrophil was divided by him into five groups with sixteen subgroups, wherein most of the nuclei consisted of two, three, four or five lobes, and only a few had an unsegmented nucleus. According to his opinion, in infectious diseases the five and four-lobed nuclei decreased in number, and the nuclei with one or two lobes, which were considered young forms, increased. He called this reversal in the normal count a "shift to the left." If such a shift was not accompanied by a leukocytosis, Arneth considered it a sign of a serious condition. Basing his opinion on the presence of the shift to the left of the nuclei, Arneth predicted the diagnosis, prognosis, and even immunity of the patient.

Within the last five years, Cooke and Ponder have offered an improvement in the Arneth interpretation. Cooke has added "Cooke's Criteria."[1] "If there is any band of nuclear material except a nuclear filament connecting the different parts of a nucleus, that nucleus cannot, for the purpose of the count, be said to be divided." By means of this criterion he has divided the neutrophil count into five separate classes according to the number of lobes. He contends that cells with two nuclear segments are less mature than those with three and so on.

We believe that Cooke and Ponder have simplified the Arneth count and have made it more readily applicable to the average medical practitioner. I am also of the opinion that this study does not take into consideration the origin of white blood cells, the maturation of the same, and does not take into consideration the cells other than granulocytes. These factors are important.

Schilling, on the other hand, was able to prove that those intermediate steps which exist between the myelocytes and the segmented neutrophils have considerable significance (with reference to the body) in certain diseases. He believes that the normal picture of the blood is a complex of cells which are mature and highly differentiated. These normal cells have their preliminary stages of development in the hematopoetic organs and enter the blood as mature elements depending on physiological requirements. He has proved that the blood picture will change as the disease varies and that slight variations in the course of a disease will influence the regulation of the white cells of the blood.

*Read before Section on Medicine, Ill. State Med. Soc., Springfield, May 18, 1932.

Origin and Maturation of the Polymorphonuclear Leukocytes

The Schilling differential count concerns itself mainly with the nuclear changes in the neutrophilic leukocytes, beginning with a single round or oval nucleus of the myelocyte and ending with the polysegmented nucleus. Maturation is a rather complex process and depends upon a series of factors. It may be divided into three stages. The first of these is found in simple marrow. The young leukocytes are seen scattered along the reticular framework. They lack differentiation. The cytoplasm is faintly basophilic and no granulations or mitochondria are present. The nuclei have little or no chromatin. This primitive reticular cell after division gives rise to a primitive free cell. Basophilia and mitochondria arise, and when these have reached their maximum the cell becomes a myeloblast. This is the type of cell found in myeloblastic anemia.[2]

The second stage has best been described by Sabin.[3] In this period of growth, granulation develops; the basophiles and mitochondria increase, then gradually disappear. The young leukocyte still wandering in the bone marrow begins to show ameboid movement for the first time. Large cells are found at this stage because there is cell division and growth throughout.

Stage three marks the end of maturation. The cells are found to be more or less uniform in size. Definite granulations, constant in amount, are seen. The cytoplasm has lost its basophilic tendency and assumes a neutral tint. The uniformity of size is due to a cessation of division. These factors mean functional maturity.[4] These cells are found in the peripheral blood and constitute the polymorphonuclear cells seen in the Schilling differential count.

A knowledge of the changes in cell morphology during the maturation process is very important from the practical as well as the theoretical standpoint. This differentiation between monocytes and juvenile cells sometimes hinges on the presence or absence of granules, and a blue or neutral tint of the cytoplasm. If one remembers that a juvenile polymorphonuclear leukocyte has a neutral tinted cytoplasm and many granules, he will avoid one of the pitfalls encountered in making the count.

Factors Regulating the Maturation of Polymorphonuclear Leukocytes

With the fact in mind that bone marrow is an organ in which these cells originate and develop, and that it holds a small store of cells with a ready potentiality toward multiplication, the question of the factors governing this multiplication is intriguing. It has been shown that the factor controlling the proportion of collapsed erythrogenic capillaries to open venous sinusoids is important.[5] Vasomotor nerves are thought to play a large role in regulating this proportion. Areas of prolonged low oxygen tension are present wherever a spastic condition of a sinusoid is present, and its has been thought that low oxygen tension favors maturation. A chemical factor due to the invading organism may also influence maturation. Yamomoto[6] cut the nerves of the leg in a rabbit and four days later streptococci were injected intravenously. Later he studied the bone marrow and concluded that it was stimulated by some factor peculiar to the invading organism. There is no doubt that both a vasomotor and a chemical factor stimulate maturation.

Factors Regulating the Delivery of Mature Forms to the Circulating Blood

It has been shown by Sabin that leukocytes enter the blood stream rhythmically and with small hourly accessions.[7] A larger rise occurs in the afternoon and at midnight than at any other part of the day.[8] This rhythmic pattern has been shown to persist both in leukopenia and in leukocytosis. A reciprocal relationship between the third stage of myelocytes and early leukocytes occurs. During a given length of time a certain number of senile leukocytes are used up, therefore, a certain number of younger forms must mature. In infectious processes an imbalance of the rhythmic outpouring occurs because certain numbers, depending on the severity of the infection, of senile leukocytes are killed. Infection also, as shown above, stimulates maturation of the younger forms. We have then an acceleration of the process of delivery. The blood picture depends on the readiness of response of the bone marrow, and the severity of the infecting organism.

The breakdown of body tissue may also play a role in the delivery of younger forms into per-

ipheral blood. Of the many substances that have been shown to cause a leukocytosis, the action of nucleic acid is most striking. Its effect has been studied and it was found that a massing of leukocytes around patent sinusoids, and a marked diapedesis, occurred when this substance was introduced.[10] Later studies showed the vacant areas from which the granulocytes had been drawn. Other investigators, however, conclude that the chemotactic factor of leukocyte response is due to an increase of substance in the body that afford the normal stimulus.[11]

The Schilling differential count is thus based primarily upon the changes occurring in the polymorphonuclear leukocyte. These changes, in turn, are influenced by maturation and chemotactic factors, and determined by a delivery of cells from reciprocal relationship between late stages of marrow cells and mature cells in peripheral circulating blood. Schilling has described four effects:

1. Weak irritation, which produces only a functional change in the blood expressed in the mobilization of the mature cellular response.

2. Intermediate irritation; a formative reaction by the addition of regenerated rod-like and other immature forms.

3. Severe irritation in which there is an appearance of neutrophilic young forms and myelocytes.

4. A very severe irritation produced by paralysis of the central and destruction of the peripheral cells, in which promyelocytes, myeloblasts and myeloblastic elements appear.[12]

Schilling believes that the first effect of toxic influence on the bone marrow is to call forth all mature cells which may be held in reserve in the bone marrow. If the infection or toxic influence persists or increases, the mature cells are destroyed, thus creating an imbalance. Should the infection go on, the maturation process again increases, and the bone marrow forms more granulocytes of the immature form than it can care for in the bone marrow; reciprocal response appears and more immature cells are found in the peripheral blood. This, consequently, is a further shift to the left and represents the regenerative shift in contradistinction to the degenerative shift of old forms. In the meantime, the eosinophils have disappeared and a decrease in the mononuclears from the reticuloendothelial system has occurred. Lymphocytes, also, have decreased relatively. This picture is the one commonly seen in acute infectious processes. If the patient recovers, a decrease in the number of neutrophils, a disappearance in myelocytes and juvenile cells, and a reappearance of eosinophils and monocytes occurs. When the lymphocytes reappear and are relatively increased, one is able to say that a reparative process is taking place.

We have used and found valuable a factor introduced by Gerard and Boerner,[13] in which the mature granulocytes are divided by the total number of immature granulocytes. By this means we record the degree of shift toward the right or left. The normal total mature granulocyte count is sixty-three and this divided by the normal total immature count of four is fifteen. A shift toward the right would increase the numerator of this factor and consequently gives us a number greater than fifteen. It means a good prognosis. An increase in the denominator decreases this number and represents a shift to the left. By setting arbitrarily the multiples of five, we have formulated a device to measure the degree of shift to the left. Thus, a number between ten and fifteen is a slight shift, between five and ten a moderate shift, and between one and five is a marked shift and a poor prognosis.

Case 1. K. U., a boy, aged 14 years, was seen on November 18, 1930. On November 15, he began to have pain in the lower abdomen about 9:20 p. m. About 3 a. m., November 16, the pain became localized in the lower right abdomen. The examination revealed a distended abdomen. Tenderness was present throughout the whole abdomen except in the left lower quadrant. Temperature 101.6° F., pulse 112, respirations 26. A diagnosis was made of a ruptured appendix with peritonitis.

The temperature and pulse increased during the next day and the patient became somewhat delirious. On November 20, he was given 500 cc. of 25 per cent. glucose solution intravenously. On November 21, his temperature fell from 104° F. to 101° F. The delirium decreased and the pulse improved. The abdominal distention began to lessen on November 22, and finally disappeared. On November 23, it was noted that a mass, the size of an orange had formed in the right lower quadrant. The patient's condition continued to improve. On December 13, he was operated upon and a small amount of pus well walled off was found adjacent to an enlarged and inflamed appendix. He then had an uneventful convalescence with the exception of a small abscess in the parotid gland which had to be drained.

Table 1. Schilling Differential Counts

Date	W.B.C.	Eo.	Juv.	Staff.	Seg.	Mono.	Lymph.	N.I.
11/18/30	6,800	0	2	15	74	2	7	4.3
11/19/30	6,200	0	3	19	69	2	7	3.1
11/20/30	7,000							
11/22/30	11,600							3
11/24/30	11,400	0	3	18	68	3	8	3.2
11/26/30	14,800	0	2	18	70	3	7	3.5
11/28/30	14,400	0	2	18	74	1	7	3.7
11/30/30	13,600	0	2	12	75	3	8	5.3
12/ 2/30	18,000	1	1	12	73	5	8	5.6
12/ 4/30	13,200	0	2	13	70	3	12	4.6
12/ 6/30	12,600	2	2	8	66	5	18	6.6
12/ 8/30	14,000	1	2	10	69	2	16	5.7
12/10/30	13,000	5	0	8	73	2	12	9.1
12/11/30	14,000	6	1	10	68	2	13	6.2
12/12/30	12,600	4	0	10	70	2	14	7.0

Comment: This case illustrates a peritonitis, secondary to an appendicitis, going on to recovery. It is noted that the nuclear index was under 5 on entrance and that it continued this way for about three weeks. A degenerative shift with a marked tendency toward the regenerative side is seen throughout. This indicated a favorable prognosis. The decision of the time to operate safely was made by noting the decrease in the juveniles, an increase in the eosinophiles and lymphocytes, and an increase in the nuclear index. An interesting point in this analysis is the decrease in staff forms with a concurrent increase in the total white count. We have seen this several times and have noted that it means a good prognosis.

Case 2. J. M. T., a woman, aged 62 years, was seen in consultation on March 16, 1931. On March 8, 1931, the patient fell and fractured her left femur. On March 10, the abdomen became distended. The following day she began to vomit bile-stained material. It had been noticed that when her bowels moved the distention of the abdomen would lessen, but that this distention would return in a few hours. She was given normal saline solution by hypodermoclysis and nothing was given by mouth. The physical examination revealed a distended and tympanitic abdomen. The eyes were somewhat sunken and the tongue was dry. A diagnosis of paralytic ileus was made due to autolytic peritonitis, from probable injury to the liver or bile passages. The patient was given normal saline solution by hypodermoclysis until March 16 when she was put on a liquid diet. She was found to have a parotid abscess on March 21. This was incised and drained and the patient made an uneventful recovery.

Table 2. Schilling Differential Count

Date	W.B.C.	Eo.	Juv.	Staff.	Seg.	Mono.	Lymph.	N.I.
3/16/31	19,600	0	0	14	74	4	8	5.3
3/17/31		1	0	11	77	4	7	7.0
3/18/31	18,800	0	0	9	75	6	10	8.3
3/19/31	24,800	0	0	9	85	2	10	9.5
3/20/31	24,800	1	0	5	79	6	9	15.8
3/21/31	33,600	1	0	6	80	5	8	13.3
3/22/31	24,000	1	0	8	76	5	10	9.5
3/23/31	17,800	1	0	5	78	6	10	15.6
3/24/31	10,800	1	1	5	69	6	19	11.5

Comment: This case illustrated a progressive increase in the nuclear index paralleling a progressive decrease in the staff forms. That a favorable prognosis could be made is indicated by the fact that throughout the course no juveniles were found until the nuclear index was over 10. An interesting point in these series of counts is the count of March 21, 1931, at which time, the total count rose 9,000 and fell again the next day to its previous level, the nuclear index meanwhile imitating this fluctuation. We have found this to be indicative of a complication remote from the original trouble. In this particular case it indicated a parotitis.

Case 3. O. E., a man aged 45 years, was referred to us on January 24, 1931. About 10 a. m. the morning of the first day he was seen, he was seized with pain in the center of his abdomen. The pain localized itself in the right lower quadrant of his abdomen about 4 p. m. An examination revealed a tenderness on pressure over McBurney's point. The remainder of the physical examination was negative. An appendectomy was done and the appendix was found to be acutely inflamed and greenish-gray in color.

It was noted on the third day that the abdomen was becoming distended. The patient also complained of some abdominal pain, but this was relieved when the patient expelled some flatus. The temperature at this time was between 99° F. and 100° F. On January 29, 1931, the patient's temperature rose to 102.8° F. and the abdomen, which, heretofore, had been slightly distended, became more distended and tense. He became delirious on January 30, 1931, and presented the typical picture of peritonitis. He was given nothing by mouth; normal saline solution was ordered by hypodermoclysis, and the patient was given 20% glucose solution, 300 cc. twice a day for the next five days. His clinical picture then changed and the patient made an uneventful recovery.

Table 3. Schilling Differential Count

Date	W.B.C.	Eo.	Juv.	Staff.	Seg.	Mono.	Lymph.	N.I.
1/24/31	17,900	0	0	0	87	13		
1/31/31	5,750	0	2	11	40	47	3.1	
1/31/31(a.m.)	4,775	0	2	8	52	38	5.2	
1/31/31(p.m.)		0	5	14	52	31	2.7	
2/ 1/31(a.m.)	9,000	0	2	10	61	27	5.1	
2/ 1/31		0	0	9	59	27	6.5	
2/ 2/31		0	2	10	67	21	5.6	
2/ 3/31		0	1	4	81	14	16.2	
2/ 8/31		0	0	2	87	11	43.5	

Comment: This case illustrates a severe shift to the left incidental to a peritonitis coming on a few days after an appendectomy. The nuclear index illustrates nicely the fluctuation going on in the bone marrow. A relative increase in the agranulocytes is seen in the regenerative shift. It is seen that these return to normal and decrease relatively as soon as the bone marrow begins to revive.

Case 4. E. W., a young woman, aged 26 years, entered the hospital on January 5, 1931. Five weeks before she began to have pain in the right lower quadrant of her abdomen. The pain developed gradually. Her temperature at that time had risen as high as 104° F. Three weeks later this pain left the right lower quadrant and shifted over to the left lower quadrant. A hard round mass about six inches in diameter was found in the left lower abdomen. No rigidity of the muscles was present. A diagnosis of an ovarian cyst twisted on its pedicle was made. The abdomen was opened on January 18, 1931, and a large cyst eight inches in diameter, twisted on its pedicle and filled with pus, was found. A moderate secondary anemia had been present before the operation, and continued, so on January 20, 1931, twelve days after the operation, a blood transfusion was given. Her further convalescence was uneventful and she left the hospital on January 27, 1931.

Table 4. Schilling Differential Count

Date	W.B.C.	Eo.	Juv.	Staff.	Seg.	Mono.	Lymph.	N.I.
1/6/31	19,200	0	0	4	80	2	14	20.0
1/7/31	16,800	0	0	6	79	5	10	13.1

Comment: This case illustrates the fact that even with a large amount of pus within the abdominal cavity the nuclear index may be normal. It serves to illustrate that the Schilling differential count gives one an insight into the defensive forces elaborated by the bone marrow. In this case the pus was well walled off and little absorption was taking place at the time of the operation. This is illustrated by the fact that a degenerative shift had taken place and the total white count was increased. We noted that a reduction in the white count was also occurring. Without the Schilling differential count this would not have been taken as a good sign, but the decrease in the nuclear index indicated that the time to operate was at hand before any further reduction occurred.

Case 5. B. H. G., a woman, aged 60 years, was seen on June 17, 1931. At 10:00 p. m. she complained of pain in her lower abdomen. Examination revealed tenderness over the right lower quadrant of her abdomen. Her temperature was 99.2° F., her pulse 84. Examination of the urine was negative. She was seen again later on in the night and an appendectomy was recommended. She refused an operation until her husband came from Chicago at 3:00 a. m., the next morning.

Upon opening the abdomen several ounces of yellow fluid welled up. A perforation was seen close to the tip of the appendix. The appendix was removed and the abdomen was then closed with drainage.

She was put on the Ochsner treatment for peritonitis the next morning. In addition to this she was given 300 cc. of 25 per cent. glucose solution twice a day throughout her illness. Her temperature rose to between 103-104° F. the second day after her operation and to 105.6° F. on her fifth postoperative day. Her pulse ranged between 88 and 110. She appeared to be recovering. On the eighth postoperative day her temperature had fallen to 101° F. and her pulse to between 80 and 94. In spite of the apparent recovery this patient was undergoing, an unfavorable prognosis was made. On the tenth postoperative day an abscess which had formed in the subcutaneous tissue of the abdomen was incised and drained. The patient's temperature continued to rise and she died on her twelfth postoperative day with a temperature of 108.4° F., and a pulse of 106.

Table 5. Schilling Differential Count

Date	W.B.C.	Eo.	Juv.	Staff.	Seg.	Mono.	Lymph.	N.I.
6/17/31								
(8:15 p.m.)	8,100							
(11:00 p.m.)	8,700							
6/18/31								
(3:00 a.m.)	9,600	0	0	11	75	5	9	6.8
6/19/31		0	0	13	76	1	10	5.7
6/21/31		0	1	12	70	0	17	5.4
6/21/31		0	3	12	73	1	11	4.7
6/22/31		0	2	18	60	1	19	3.0
6/23/31		0	3	10	73	0	14	4.7
6/24/31		0	3	6	86	2	3	9.3
6/26/31		0	4	6	84	1	5	8.4
6/27/31		0	3	7	85	0	5	8.5
6/28/31								
(2:10 p.m.)		0	3	10	82	0	5	6.3
(6:00 p.m.)		0	5	9	80	0	0	5.7

Turk cells—4, Normoblasts—2.

Comment: This case illustrates an overwhelming infection in an individual with little or no resistance in so far as her white blood cells are concerned. Three counts less than 10,000 were encountered before operation. No eosinophiles were seen in the series of Schilling counts done. We have seen this occur but a few times in the great number of series of Schilling counts and have observed that if an aneosinophilia persists past the sixth postoperative day, the infection usually overcomes the patient. The fact that at only one time an increase of the staff forms over 12 was encountered is indicative of the fact that the bone marrow response of this patient was impaired. This is also emphasized by the fact that the juvenile cells rose above 4 just before she died. A lack of repair is indicated by the fact that the monocytes were decreased and in some slides absent throughout the whole series. In an ordinary case of appendicitis going on the recovery, the monocytic response starts about the third day and reaches its height about the seventh day. If this response is seen, we are certain the patient is going on to recovery. This is lacking in this case as these series show. The lymphocytic stage of subjugation of the infection occurs between the seventh and tenth day after operation. It represents the final overcoming of the infection by the body. It is

seen here that this is likewise lacking in this case. The nuclear index shows that this patient reached the climax of her resistance to the infection on her seventh postoperative day. Clinically she reacted in much the same manner. Her relatives had great hopes of her recovery at this time. We too might have been misled if the Schilling on the subsequent days had not shown the unfavorable picture that it does. By this means we were able to give a correct prognosis, unfavorable as it was.

Case 6. W. L., male, aged 18 years, was seen about 9 p. m., January 2, 1932. Patient took sick December 31, 1931, with a pain across the lower abdomen. The morning of his entrance into the hospital the pain localized in the right lower abdomen, and he vomited for the first time. He had been seen by his family doctor for two months before with a similar complaint and the diagnosis at that time was acute appendicitis.

Physical examination on entrance revealed tenderness over McBurney's point, slight rigidity of the muscles over the right lower quadrant of the abdomen, and a positive Brittain's sign. The remainder of the examination was negative. Examination of the urine was negative.

This patient was operated upon immediately that evening. The appendix was found to be surrounded by adhesions and upon accidentally separating these, a free fluid escaped to the outer side of the cecum. The appendix was clamped, ligated, cut off flush with the cecum and the abdomen was closed with drainage. The appendix was opened after the operation and was found to be gangrenous especially at the tip. The patient then underwent an uneventful convalescence and left the hospital January 15, thirteen days after the operation.

Table 6. Schilling Differential Count

Date	W.B.C.	Eo.	B.	Myel.	Juv.	St.	Seg.	Lym.	Mono.	N.I.
1/ 2/32	29,900	0	0	0	0	6	80	4	10	13.6
1/ 4/32		0	0	0	0	0	87	7.5	5.5	87/0
1/ 5/32		0	1	0	0	1	78	16	4	78
1/ 6/32		0	0	0	0	0	78	12	10	78/0
1/ 7/32		3	0	0	0	1	84	9	3	84
1/ 8/32		1	1	0	0	0	80	11	7	80/0
1/ 9/32		1	0	0	0	0	85	10	4	85/0
1/11/32		2	0	0	0	1	77	13	7	77
1/13/32		0	0	0	0	1	67	32	2	67
1/14/32		3	0	0	0	0	80	15	2	80/0
1/15/32		1	0	0	0	1	59	35	3	59

Comment: This case illustrates the value of a Schilling differential count to determine the operability of a patient suffering from gangrenous appendicitis. This patient was seen 43 hours after the initial attack. Ordinarily it has been considered that after 36 hours, the appendix usually perforates and the patient has a peritonitis. A diffusing peritonitis should be treated medically in the hope that the process does not continue to spread. And surely it has been long recognized that a diffuse peritonitis should not be operated upon, but treated medically to combat the infection by enhancing the patient's individual resistance to the infection.

We believe that in this particular case the Schilling differential count told us this lesion was of the circumscribed type, even though we were sure before the operation that the appendix was gangrenous. It is seen that the total white count was very high on entrance. With this we have but a slight shift toward the left as expressed by the nuclear index of only 13.6. The monocytes were increased to 10 on entrance. We have always taken this to be a good sign of local defense reaction, that is to say, as far as the tissues contiguous to the appendix are concerned, there is an attempt to localize to the region immediately about the appendix. If the Ehrlich classification had been adhered to, I do not believe the patient would have been operated upon. The total number of polymorphonuclears are 86 and this, I believe, has been considered as unfavorable to operation. This is better illustrated by the Schilling differential count which was done January 4, at which time there is but an increase of one in the polymorphonuclear count, practically the same as the count immediately above it. But the concept is changed much because it is not the total number of granulocytes present, but rather the age of these that is of value. This represents a transition from a slight shift to the left to a marked shift to the right. A return of eosinophils on the fifth day after operation is found. We are always glad to see these cells appear in a series of counts, for to us they mean that the acuteness of the infection has disappeared. The eosinophils persisted, with the exception of one day, until the patient was discharged from the hospital. The lymphocytic subjugation of the infection is illustrated in the last three counts in table 5. Concurrent with this is found a relative decrease in segmented cells. The nuclear index shows that at no time during the patient's stay in the hospital was he in great danger of being overwhelmed by his infection.

Conclusions:

1. A series of Schilling differential counts is of infinitely more value than one alone.

2. The Schilling differential count is a valu-

able aid in evaluating the progress of a patient whether toward recovery or dissolution.

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DISCUSSION

Dr. Lyman C. Murphy, Chicago: I think that Dr. Sours deserves much credit for his excellent presentation of this rather recent development or improvement in the differential blood count. I say recent; of course, for a number of years attention has been paid more or less to the study of immature forms of leukocytes since Arnett published his results of his own studies, but it was not until Schilling had simplified Arnett's work that interest has been renewed in this phase of leukocyte counting.

As far as I can gather, the interest in this phase of leukocyte counting is somewhat sporadic, that is, some hospital laboratories pay no attention to the Schilling count whatever; some do them on request, and others do them as a matter of routine. Many use a modification of this Schilling count and simply enumerate the non-filament or non-segmented forms as compared with the total segmented forms.

I think that one should remember that the laboratory work in any case, as a rule, only amounts to about 10 per cent. of the evidence in that case; and bear in mind that the enumeration of immature cells or new additions like this do not offer any short cut to the diagnosis or prognosis of a given case. But bearing this in mind I am sure that there are many instances where enumeration of the immature leukocytes will be definitely helpful.

Recently at a hospital staff meeting in Chicago I heard a doctor present a case in which he was called as a consultant. He said that he felt sure that he was dealing with a surgical belly and ordered a leukocyte count. The report came back from a good laboratory with a total count of 6,000. The doctor stated that on account of this normal leukocyte count he hesitated as to what he should do and finally decided to wait. On the following day the patient was growing worse and he decided to operate in spite of the leukocyte count, and found a gangrenous, ruptured appendix. The patient died a few days later. This doctor then stated that in this case the laboratory work was not only not helpful but actually harmful.

I think that this is an instance in which the Schilling count, showing a high percentage of immature cells, in spite of the low total count, would have shown this doctor that he was dealing with a severe infection and the patient might have had a better chance with operation a day earlier.

The other type of case in which the Schilling count may be of value is, as stated by Dr. Sours, the case of acute infection apparently going on to recovery with no definite untoward symptoms and return to normal of the total count when the Schilling count shows a persistent shift to the left and the prognosis invariably is bad.

For these reasons I believe that the Schilling differential count has a definite place in the total and time-honored differential count of leukocytes in all cases of acute infection.

THE USE OF BICHLORACETIC ACID IN SURGERY*

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Apart and independent of the consequences of the general depression, there are additional causes for the economic difficulties in which the rank and file of the medical profession find themselves today. I refer to the fact that the medical profession has gradually permitted certain functions that legitimately belong to it, to slip away. In this short article I wish to call attention to a remedy which I have found of considerable value, a remedy which if generally used would relieve a great deal of discomfort and pain and incidentally materially increase the incomes of the members of the medical profession.

Corns and callouses probably cause civilized man and particularly woman more discomfort, inconvenience and nearly as much pain as any other ailment. As long as shoemakers and women are more interested in style than in efficiency and comfort, the human race will continue to be thus afflicted.

To those who have reached the age of discretion and insist on getting foot-wear that fits the feet, there is now available a remedy which offers quick and permanent relief from corns and callouses. For those who persist in wearing ill-fitting, conventional shoes it offers at least tem-

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porary relief. I refer to full-strength bichloracetic acid. Glacial acetic acid has long been recognized as a corn remedy. Trichloracetic acid is very effective for cauterizing moderately swollen and congested mucous membrane covering the inferior turbinateds but as far as I have been able to find bichloracetic acid has never before been advocated in surgery.

Pure bichloracetic acid, which is here recommended for the treatment of corns, callouses, and warts, is a clear, colorless liquid at room temperatures. It is somewhat corrosive to normal skin and consequently has to be used with care. Professor Louis Kahlenberg of the Department of Chemistry of the University of Wisconsin, as far back as 1919 called my attention to the fact that bichloracetic acid dissolves keratin, the chief constituent of corns, callouses and warts. I have used it since then on a considerable number of patients, for the relief of these conditions, to their and my complete satisfaction. The method of using bichloracetic acid as described hereafter is substantially that suggested to me by Professor Kahlenberg. Bichloracetic acid is still a relatively little known remedy and some care has to be exercised in order to procure a pure product. Reliable wholesale drug houses carry pure bichloracetic acid in stock.

DIRECTIONS FOR USE

1. With a camel's hair brush apply a thin film of vaseline around the corn, callous or wart so that the bichloracetic acid cannot come in contact with the surrounding normal skin. Be careful not to get any vaseline on the area to be treated.

2. With a glass rod apply a little of the liquid to the lesion, just enough to moisten the surface well. The liquid will be absorbed in a minute or two. Then apply a little more of the liquid and repeat this two or three times depending upon the thickness of the horny layer. It is well to have a little sodium bicarbonate moistened with water into a paste at hand, to apply quickly in case some of the bichloracetic acid should come in contact with the normal skin. So far as my experience goes there is, however, no particular danger in applying too much directly to the corn or callous. These structures are thickenings of the horny layers of the skin and the bichloracetic acid seems to have an affinity for this tissue and not to penetrate beyond it to the underlying normal skin if reasonable care is exercised. After the bichloracetic acid has soaked in well, remove the vaseline thoroughly with a cotton pledget and cover the area with a thin film of flexible collodion and let the patient go about his business with directions to return in from three to five days.

3. When the patient comes back cut the hardened area off with a sharp scalpel and repeat the treatments described under one and two if necessary. Two to four treatments have permanently cured every case of callous or corns that I have treated during these years providing the patient has thereafter worn properly fitting shoes.

The two chief faults of the foot-wear worn by Caucasians in general are, undue pressure over the instep from above, and insufficient treading surface. The former causes corns on the little toes by forcing the anterior portion of the foot outward causing constant pressure of the little toe against the uppers. The latter by the uneven pressure upon the sole of the ball of the foot will sooner or later result in the formation of callouses. A less common fault of modern shoes and yet all too common among women is crowding a number five or six foot into a three or four shoe. This often results in corns on one or more of the other toes.

Shoe manufacturers seem never to have heard of the third dimension of space. The length of the shoe is indicated by a number and the width by a letter but the height of the instep has received little or no attention with the result that the higher the instep the individual is blessed with from birth, the more likely he is to have difficulty in getting fitting shoes and the more certain he is of developing corns on his little toes. If one in buying shoes will insist that there be no undue pressure over the instep and that the treading area be the full width of the sole of the foot he will never be troubled with either corns or callouses. If these have already developed he can be permanently relieved of them by the proper use of bichloracetic acid and thereafter wearing shoes that fit the foot.

If there is any group that knows less about the requirements of foot-wear than the manufacturer, it is the average shoe salesman. A common experience when one wants to buy a pair of shoes is about the following: A shoe clerk tries

several pairs on your foot and if none of them fit perfectly, as is usually the case, he will pick out the nearest fit with the observation: "Wear them a week or so and they will fit nicely." Both the salesman and the customer seem not to know or to have heard of the physical law "that action and reaction are equal and in opposite directions;" that a shoe which has to be "broken in" also "breaks in" the foot at the same time and to about the same degree.

Many articles on proper foot-wear have been written from time to time but few of them have stressed the pressure on the instep and the inadequacy of the treading surface as strongly as they should. The latter point, however, is well brought out by Grossman[1] who says: "The writer has observed by actual measurements that the average foot is one inch wider than the shoe usually worn." If all or even many customers would insist on being properly fitted, the shoe manufacturers and shoe stores would soon supply the kind of footwear that the public wants and should have.

As stated before, not to get a fitting shoe causes a good deal of discomfort and a good deal of expense to the individual. A prominent woman patient told me not long ago that for twenty years she had been going to a Chiropodist every four weeks and paying him three dollars a treatment in order to have reasonable foot comfort. This has been secured at an outlay of approximately seven hundred fifty dollars. She has had permanent relief for twenty-five dollars; tough on the Chiropodist but good for the patient and the doctor.

The following is a typical though rather severe case representing this general type of ailment:

Mrs. G. F., aged 57 years. Has had trouble with corns and callouses for many years; much worse past year; recently very painful, difficult to walk. Has been wearing arch supports, metatarsal pads and various kinds of pads between toes. Moderate bunions both feet not causing any trouble however. Right foot very painful, corns on third and fifth toes, thick callous on ball of foot two and three-fourths by two inches. Left foot, small painful corn on fifth toe, thick callouses on ball of left foot two and one-half by one and one-half inches. Moderate ingrown toe-nail on great toe. No evidence of flat foot or weakness of transverse arch on either foot. Calf muscles soft and well developed. Width of ball of foot four inches, working shoe worn today three and one-fourth inches though patient says this shoe is wider than one usually worn. All pads discarded. Advised to get wider shoes.

April 11, 1932: Corns and callouses treated with bichloracetic acid.

April 16, 1932: Corns and callouses trimmed. Thick layer of horny material removed from balls of both feet. Areas again treated with bichloracetic acid.

April 23, 1932: Corns and callouses again trimmed. Another thick layer removed from callouses. Corns and callouses again treated.

May 6, 1932: Thin layers of corns and callouses removed. Underlying skin perfectly normal in appearance and feel. Patient expressed great satisfaction at comfort achieved. Feels no need nor desire for all the paddings.

Even those who will not wear sensible, well-fitting shoes can be kept relatively free from corns and callouses by this method by having a treatment every three months. This method has a number of distinct advantages over all methods with which I am familiar. It is painless, permanent, leaves no scars, in fact, leaves the skin pliable, smooth and perfectly normal in function and appearance.

The fifteen to twenty-five dollars that can be charged and collected will buy a good many more groceries and pay more office rent than will the bills rendered for laparotomies and not collected and not collectable after the hospital and special nurses have been paid. In addition the patient will be saved considerable money by the physician doing a better job than the Chiropodist can do or at least does do. I have been informed by the Department of Registration and Education of Illinois that forty-four Registered Chiropodist Licenses were issued during 1931. Publication number 15 of the Committee on the Costs of Medical Care states that there are approximately five thousand Chiropodists practicing in this country. The public would be far better served if the members of the medical profession would when making routine general physical examinations carefully examine the feet of their patients and the shoes they wear, and advise them about their foot-wear in order to relieve them of their foot troubles. This is a problem well worth serious study and consideration.

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DISCUSSION

Dr. I. F. Harter, Stronghurst: Dr. Ochsner did not tell how to apply this medicine.

Dr. John J. Gill, Chicago: I am not in the habit of treating corns but once in a while they do come in. I have used salicylic acid with excellent results. I think dichloracetic acid would be well worth using.

As Chairman of the Committee on U. S. P. and N. F. of the Chicago Medical Society, I have been trying to persuade the doctors to use the things which are avail-

1. Grossman, Jacob, M.D. Common avoidable foot ailments. Medical Review of Reviews, March, 1932.

able through the drug store instead of patent preparations which are stealing money away from them. When you hand a patient something that comes from a pharmaceutical house, he will the next time go to the drug store and buy it over the counter. Druggists are each day sending out prescriptions over the counter that are for proprietary preparations instead of for things written out by the doctor. It is easy to write a prescription if you bear in mind the instructions you had in school about soluble substances, sweetening agents and solvents. I think if physicians will pay more attention to their own prescription writing they will do better. Such wholesale prescriptions can never be satisfactory because when a prescription is put up for a great number of people it cannot be suited to the individual requirement. You must keep your prescription limited in amount. This is off the subject but at the same time it comes back to the economic side which Dr. Ochsner brought up. Never prescribe a larger amount of medicine than the patient can use for immediate needs. Some change may occur, some symptom may arise that will require a change in the prescription. You can use the same drugs over and over again by varying the mode of application. Use compound tincture of cardomom one time, the next time use elixir of glycyrrhiza or vary your solvent and you can have a different prescription. When you are doing that you can use the same active ingredient for a half dozen in the family but by varying the vehicle they will not know. Do not prescribe aspirin but prescribe acetyl-salicylic acid; do not prescribe it in plain powder form or tablet; the taste is too characteristic. Add a few drops of oil of wintergreen or mix it with any simple thing like compound licorice powder to cover it up and the patient will not know what he is taking.

Dr. J. A. Cousins, Chicago: I want to ask Dr. Ochsner a question. My observation has been that while there are about 45,000 doctors in this country there are about fifteen million practising medicine. How is he going to keep this remedy out of the hands of the chiropodists because if it has any virtue they will use it immediately

Dr. A. L. Nickerson, Kankakee: On the floor where I practise there are two chiropodists and one of them is using my waiting room. I have learned considerable about their methods. I understand the late Dr. John Dill Robertson was president of one of their colleges and that a quite famous surgeon in Chicago is a teacher in the school. Is there any ruling in the Chicago Medical Society on the standing of men who teach in these schools?

Dr. Edward H. Ochsner, Chicago (closing the discussion): The question the last gentleman asked is very important. Its solution is up to the rank and file of the medical profession. Ninety-nine times in a hundred medical men have the first chance at the patients, and if they let the patients slip away to the chiropodists it is their own fault. As medical men we have been too much concerned about gall bladder disease, appendicitis, thyroid and prostatic diseases and have too often neglected the common ailments. Shortly after Ehrlich's side chain theory first came out, I looked through the examination questions asked by the various state boards as published in the Journal of the American Medical Association. In every one of the sets there were several questions on the Ehrlich's side chain theory. What has this theory to do with the actual practice of medicine? Very litle, if anything. The proof of this is the fact that now it is rarely being asked in examination questions. Today the students are asked many similar unessential questions such as the probable causes of pernicious anemia. In order to pass the poor student has to know the answers not one of which is probably correct. Our professors are spending too much time going into details about the rare things in medicine and too little about the common ailments. I have had to deal with several hundred internes in the last thirty-five years and they are becoming more and more learned and theoretical and less practical. I have not come across a single interne in years who can properly strap a chest or who knows how to treat a common cold. On a number of occasions I have been called in consultation by young men to find them confused and unable to make a diagnosis of some simple ailment or unfamiliar with some valuable but simple remedy. Twice these young men have said substantially the following, "Why in the name of common sense were we not taught these simple things in the medical school."

In the application of the remedy one has to be careful not to get the vaseline on the corn, callous or wart because even a thin film of vaseline will prevent the remedy from coming in contact with the lesion. The acid should be applied with the glass rod so as not to get it on the fingers of the one applying the remedy. It is not as corrosive to normal skin as it is to corns or callouses because the latter contain more keratin.

In answer to the question of how many treatments are required, I would say from one to four. I have never had to treat any case more than four times.

I want to repeat what I said a moment ago. The profession as a whole is to blame for most of its troubles. A certain per cent of patients insist on being fooled. They are the type who buy every worthless stock and go from one quack to another as long as they live. They can not be saved. However, if the profession in general will devote more time in treating the simple ailments effectively much of this quackery can be eliminated.

THE COST OF MEDICAL EDUCATION: ITS RELATION TO THE COST OF MEDICAL CARE*

I. H. Neece, M. D.
DECATUR, ILL.

Search for and interpretation of facts concerning the vital processes have been the prime objectives of the medical profession since the time that medicine emerged from a maze of folk ways, incantations, and superstitions. They have so

*Study of the Cost of Medical Education by the Committee on Medical Economics of the Illinois State Medical Society.

over-shadowed all else with which the medical man's life is concerned that there has been little study or thought given to other aspects of medicine.

It remained for the present day, when pressure was brought both from within the profession and without, for medical teachers and investigators to discover the relation between the cost of a medical education, the cost of medical care, and the income of the physician.

The time required in the study of medicine has been increased again and again in the last half century. The cost of a medical education has been increased accordingly, both to the student and to the source that makes up the deficit between what he pays in fees and what it actually costs to instruct him. If the school be a state or city university the size of this deficit is a matter of direct public concern since it is made up through taxes. If it be a privately maintained institution, the concern is of the school and medical profession, both of which should conserve its resources.

I do not propose to recommend a lowering of the standards of minimum requirements in order to reduce the time and cost of a medical education. I merely wish to lay before you the facts that are available. They are limited in their scope, as I said before, because the cost of preparing for a medical career has come only recently under the eye of the profession as a whole.

First, let us see what it costs to become a physician under present conditions and according to modern standards. Perhaps a comparison to the cost of an education in the past would make it more clear.

Angus McLean, M. D., Detroit, presented an interesting comparison of the years 1874 and 1931 before the Wayne County Medical Society recently. In 1874 if a man had attended high school or could pass a not too rigid examination, he might enter medical school in the University of Michigan. In 1931 he must have graduated from high school and have had at least two years' preparatory work in a university before he may enter the medical school.

Fees in 1874 for the student amounted to $20.00 for the first term and $10.00 a term thereafter. In 1931 fees together with laboratory charges in that school amounted to $250.00.

Clinical material in 1874 was composed of patients who paid their own transportation and often their hospital bill. In 1931 Wayne County alone paid $221,556.80 for transportation, hospital expense and other costs connected with obtaining clinical material. This cost, amounting to $4,000.00 for each graduating senior, was met of course by the taxpayers.

A total of 12 months' time was invested by the student in 1874 in study in school and with his preceptor. A total of 66 months is the minimum required of the present day medical student. The length of the course in 1931 is more than five times that of 1874 and the cost of graduation per student is consequently greater for both himself and the state.

The cost of medical instruction last year averaged about $704.00 a year for each student enrolled. Of this cost the student paid an average of about $254.00. Neither of these figures include the cost of microscopes, laboratory fees, materials and individual costs to students.

Whence came the money to pay for the difference between what the student paid and what the education cost the school? The incomes of 63 medical schools reported in the Journal of the American Medical Association on August 20, 1927, shows the costs of operation made up as follows:

Student fees	$ 4,057,304.00
Endowment income	2,784,527.00
State or city tax	2,574,973.00
Other sources	2,567,059.00
Total	$11,983,973.00

Thus we see that the student pays about one-third of the cost of his education. This of course is considerably lower in some universities, especially those maintained by the state, and considerably higher in some of the higher priced institutions.

Certainly, many will say, a student should be willing to pay a third of what his education actually costs. The student, as a rule, is willing to pay. But the share which he must pay, along with the total cost of medical education has been bounding upward with no sign of losing its momentum.

In 1910, with 129 medical schools in the United States, the average fee was $125.00. Five years later the average had increased to $141.00. In 1920 it had leaped to $222.00; and in 1930 the 86 schools of medicine in the country averaged $302 for fees.

There are several very real objections to this tendency. The cost of medical education seems

bound for such heights that only the sons of the well-to-do may enter the profession. Along with the increased cost of the courses and the lengthened time of attendance, the studies themselves have become so complicated and so crowded upon one another that working one's way through medical school to make up for deficient fund is impractical if not impossible.

Medical educators on every hand advise boys against planning to work. Walter L. Niles, dean of Cornell University Medical school in New York, advises against the student working in medical school.

"I think it is generally best for the poor boy to avoid the necessity of very much outside work during the college year," he says in discussing his views, "and I think it always is a mistake for him to interrupt his course once started."

"It seems better to me for him to work for a year or two before commencing the course, or, when possible to borrow funds which he will subsequently repay. There is, however, a serious objection to mortgaging his future so that he feels compelled to begin remunerative work immediately upon completing his hospital internship. It means that then, instead of earlier in his development, he must interrupt his scientific career for the necessity of making money.

"How often do men well qualified up to that point, reply, when we urge them to continue in scientific medicine, that they must begin to make some money. It is very discouraging to the teachers and their efforts have, to a certain extent, been wasted," Dean Niles concludes.

We have seen now, what the medical education costs the student in time and finances; what the public or private endowment funds must pay; what the profession itself loses when capable men abandon scientific medicine to seek financial gains because of pressing debts of their college education can only be conjectured.

But the complete picture of this high cost of medical education has not yet been seen. There is much said about the high cost of medical care by the lay public. Medical sources have answered that a physician must obtain a fee that will justify the expense and time invested in his education.

In the last three years we have become keenly conscious of these economic and social problems. They have been discussed from every angle and the physician, with his so-called exorbitant fees, has not been spared. These arguments are aimed at the average physician, so we may take the average physician to reply.

Gordon Heyd, M. D., in his presidential address at the Medical Society of the County of New York, gives a vivid picture of the facts of the case.

"The doctor of today is about 28 years old before he begins to practise. What has it cost in actual dollars and cents to produce this educated and trained product? His pre-medical and medical education, with fees, maintenance and miscellaneous expenses, will cost $16,000.00. His loss of earning capacity while being professionally educated might be roughly estimated, for six years, at $12,000.00.

"This young man begins practise at 28 years of age with an invested indebtedness of $28,000.00. Upon this he should pay $1,400.00 a year interest. I seriously doubt, although I have no figures to verify it, whether 80 per cent of the doctors ever overcome this primary indebtedness.

"In other words, more than four-fifths of our profession never pay their capital investment by leaving an estate equal to $28,000.00. I think they never make up the carrying charges by saving annually $1,400.00 a year.

"In order just to break even with the board, a physician must have saved $1,400.00 a year after graduation, and have created, in addition, an estate valued at $28,000.00 before he dies."

Criticism that the average medical student in the United States is nearing 30 years of age before he is ready to practise may be modified to some extent by the quarter system which has been introduced in seven medical schools. The system provides for school throughout the entire year and enables the student to graduate in considerably less than four years.

It also gives continuous use for educational purpose of a building and equipment, especially of the hospital, which must operate continuously throughout the year in any case. Perhaps this also may have some slight effect in reducing the total cost of medical education by reducing the overhead expense.

Opportunity for distribution throughout the year of teaching service of professors and for the prosecution of their research work at a season and place most suitable for it also is afforded under the quarter system.

But the financial cost of medical education cannot be reduced as easily as the time element has been met through a full school year. There is no disposition on the part of the profession to reduce standards. As long as high standards are to be maintained and medical science expanded, and the new developments added to instruction, there is little hope of reducing the total cost of the education.

It is, of course, possible to further reduce the amount that the student himself must pay. But when that source of income is reduced the medical school must meet the loss with an increase on some other hand. There is little help to be expected, in these times of tax reduction demands and programs, from the public funds. Endowment funds might prove a solution in the distant future, but endowments are built slowly and usually are given closely bound up with provisions by the donor. The other sources of revenue are so miscellaneous that they fall under no general rule and can offer no widespread solution.

There remains only the revenue obtained from patients to make up, to the individual physician, the cost of his medical education. Far from increasing these fees, the demands for reduction in the cost of medical care is a barrier in that direction.

MANIPULATION OF THE STIFF SHOULDER*

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CHICAGO

The selection of the case suitable for manipulative treatment is a matter of judgment based on experience and precept. The application of this method of treatment is, however, an art. The criteria of artistic expression are often or generally decided by the teaching of some master artist by whose personality and virtuosity the trend of opinion is crystallized and whose teachings are followed blindly by assistants and disciples until some formidable new school of practice arises. This is equally true in the realm of the fine arts and the surgical arts. We can thank the osteopaths for forcibly and painfully directing our attention to the benefits of manipulation in certain joint conditions.

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Had Hugh Thomas understood the sound physiological basis upon which the practice of manipulation now rests, he would not have uttered that pronouncement which, backed by the weight of his great prestige and authority, has retarded the development of physical treatment and, especially, scientific manipulation among the orthodox profession, even till the present time, and fostered the development of thriving schools of osteopathy and peripatetic "bone setters." The full quotation of his pronouncement is as follows:[1]

"For many years after the commencement of my experience in surgery, I had the opportunity of observing the practice of those who had acquired a good reputation for skill as successful manipulators. I have resorted to these performances, and for many years believed that my interference assisted recovery. Long ago I have, from a more complete knowledge, confirmed by crucial tests, so selected them that *I cannot find suitable cases upon which I would perform the deception known as passive motion.* And whereas in the early days I believed that much aid was given in recovery by passive motion, now I know by well-attested facts that some of the marvels of my past practice had been marred by the very treatment I was so proud of."

This view, from so celebrated an authority, formulated and unremittingly reiterated for the 15 years following 1875, substantiated the enduring opinion inculcated in the mind of the British regular practitioner by John Hilton's notable volume,[2] "Rest and Pain," based on his principle of treatment by rest without massage or manipulation. He had, from 1853 to 1878, successfully and brilliantly preached a system of therapeutics in which exercise, active and passive, had no more place than massage or manipulation. The principles of Hilton and Thomas are still strongly operative in America in influencing the old style regular practitioner against manipulative measures.

Then, too, the unfortunate results following the application of "brisement forcé," or the powerful manipulation and wrenching of a stiffened joint under anesthesia, has engendered in many surgeons a lasting aversion to this treatment.

However, clinical experience is demonstrating

1. Thomas, Hugh: Principles of the Treatment of Fractures and Dislocations. Part VI of Contributions to Medicine and Surgery. P. 66. 1886.

2. Hilton, John: Rest and Pain. London. Bell and Daldy. 1863.

that there is a narrowly limited group of indications based on the interpretation of definite symptom pictures of chronic shoulder conditions in which expert manipulation is advantageous.

It is our purpose to point out types of pathology which justify, and describe the technique by which, this treatment should be administered and which in our experience has yielded satisfactory results.

Cases in Which to Avoid Manipulation. The determination of the stage of contracture of the soft tissues about the shoulder joint is more important in arriving at a decision on the indication for manipulation than the accurate diagnosis as to the exact location of the pathology with five notable exceptions. Manipulation is definitely contraindicated in:

1. Tuberculosis of the shoulder joint.
2. Syphilitic and parasyphilitic articular or peri-articular lesions.
3. A tendency to myositis ossificans.
4. Gonorrheal affections.
5. Cervical neuritis and radiculitis.

The diagnosis as to the stage of contracture depends upon the varying aspects of the four symptoms, (a) limitation of motion; (b) pain; (c) weakness; (d) tenderness.

The presenting symptom of all stiffened shoulders is of course limitation of movement. The position which the arm tends to assume after traumatism or inflammatory irritation of the shoulder joint is one of adduction, slight flexion or "protraction" and internal rotation. This position relieves the normal pressure between the great tuberosity with its attached supraspinatus tendon and the acromial process. The position of muscle balance between adduction and internal rotation on the one hand and abduction with external rotation on the other is not established in man because in the first place the internal-rotator-adductor group of pectoralis major, teres major, subscapularis and latissimus dorsi are much more powerfully developed than the shorter and smaller external-rotator-abductor group of deltoid, supraspinatus, infraspinatus and teres minor. The "purchase" of the abductors and external rotators (i. e. the distance from the fulcrum of joint motion to the muscle insertion, the weight arm, more nearly approaches the power arm (to muscle origin) than is the case in the abductor and internal rotator group, which in general arise at some distance away on the chest wall rather than on the scapula.

In the second place the weight of the arm has no counter-balancing "plastic muscle tone" in this extremity of man. Since he has assumed the orthograde position "plastic tone" as shown in decerebrate rigidity is only displayed in a definitive pattern in the "antigravity" muscles of the lower extremities. In the early stages of shoulder stiffness the limitation of motion is largely due to muscle spasm. Later fibrosis of muscle and ligamentous contractions as well as intraarticular adhesions take its place. How are we to distinguish the limitation of motion, that is, muscle spasm, found in the active progressive joint disease in which manipulation is usually contraindicated, from limitation due to adhesions within or without the joint? The criteria are these. In the presence of active or progressive joint lesions a limitation of motion in all directions is expected. Furthermore, pain and spasm begin even with the first few degrees of active or passive movement. In distinction from this in the shoulder incapacitated by adhesions most of the joint motions are comparatively free, the limitation being particularized by the special pathology of the particular condition. This makes a diagnosis of the pathological change in capsule, bursa, ligament or muscle of at least some importance for purposes of treatment. The bony obstruction to movement infrequently found in osteoarthritis renders attempts at manipulation useless.

Pain when adhesions or inflamed muscle is stretched closely stimulates the pain on motion of a tonically spastic muscle. The patient learns to avoid these movements which give rise to such stretching and pain. Consequently the muscles which produce the painful movement lose their normal tone, atrophy and become fibrosed and shortened. Often the tonic spasm and fibrosis must be relieved by a course of baking and massage before the diagnosis of the underlying lesion can be made.

Nocturnal aching is a not infrequent symptom. During the waking hours the sets of muscles which prevent painful motion due to the approximation of inflamed surfaces are on guard. When complete muscular relaxation occurs during sleep, adhesions are dragged upon or a damaged supraspinatus tendon impinges upon the

acromion and the patient wakes with a painful start.

Tenderness is either located over the actual pathology or over the spastic protecting muscle or is referred to a muscle insertion. The latter occurs classically in supraspinatus tendon and subacriomal bursa lesions at the insertion of the deltoid. In supraspinatus lesions local tenderness over this tendon which disappears as the tendon passes under the acromion on abducting the arm (Dawburn's sign) is a conspicuous finding.

Weakness and loss of power in the contracted atrophied muscles is often accompanied by a soft crepitus on palpating the affected muscle. The weakness of the external-rotator and abductor groups is not to be confused with the more diagnostic atrophy or for instance of the supra and sometimes also the infraspinatus tendons in supraspinatus pathology. Sudden loss of power in a muscle group or the affected limb during a delicately coordinated action (the "down it will go" symptom of Codman) are probably due to reflex muscle inhibition when a tender adhesion or joint surface is stimulated by motion.

X-ray examination of the examined shoulder must not be omitted since the diagnosis of early tuberculosis and bone malignancies which must not be manipulated often rests upon roentgenological evidence. However, Kind and Holmes,[3] who studied roentgenologically 350 painful and stiff shoulders excluding cases of fracture and dislocation, found that only 50 of these or 14.3 per cent. presented x-ray evidence of bone or joint pathology. They concluded that the differential diagnosis of arthritis, bursitis, tendon and periarticular lesions must frequently be based on clinical examination. Loose bodies in the joint or subacromial bursa visualized in the roentgenogram certainly cannot be expected to become symptomless after manipulation. A tendency to myositis ossificans extending along muscle and fascial planes contraindicates any forcible treatment.

Specific Contraindications. Tuberculosis disease of the shoulder is fortunately rare. Knagg[4] has compiled 602 cases of bone and joint tuberculosis in the Paddington Green Children's Hospital, London, and finds 0.8 per cent. involved the humerus and 1.5 per cent. any part of the shoulder apparatus. There is rarely any difficulty in excluding a stiff shoulder due to tuberculosis. Injury is a patent exciting cause of tuberculous disease but the history of gradually increasing disability following an injury, generally a trivial contusion or sprain, after some considerable interval is quite different from that of the continuous train of symptoms following a traumatic synovitis or arthritis. The slight general swelling about the joint, marked wasting of muscles even within a few days after disability is complained of, help to distinguish the tuberculous from the traumatic affection. Animal innoculation of aspirated joint fluid is generally unnecessary as the roentgenogram even at this early stage presents the typical characteristics of early tuberculosis of bone, that is, relatively slight necrosis as compared with the amount of local and surrounding rarefaction.

Syphilis of joints is uncommon, and may appear as a chondro-arthritis as described by Bowlby[5] in 1894. Virchow had already named this condition. Except by serum reactions, therapeutic tests and the presence of luetic lesions elsewhere, these conditions cannot be differentiated from osteoarthritis, although the differentiation for indication of treatment is essential. Roentgenological evidence is not conclusive. There is an irregular atrophy and erosion not localized to points of pressure; there is no eburnation of exposed bone and no tendency to lipping or osteophytic production. Contrary to the common opinion, the Charcot joint is often quite painful at first and this symptom follows a slight trauma. Great swelling appears. As this subsides the joint is more apt to be lax than stiff. Early x-rays may show a calcium deposit suggesting calcified subacromial bursitis. Hypertrophic and atrophied joint changes are visible and the diagnosis must be based on the establishment of a luetic etiology.

Gonorrheal synovitis presents a shoulder with general muscle spasm and pain at the very onset of all motion. Fibrosis of most of the periarticular structures and shoulder muscles occurs early and tends to be progressive often to a stage of

3. King, J. M. and Holmes, G. W.: Diagnosis and Treatment of 450 Painful Shoulders. J.A.M.A. 89:1956-1961. Dec. 3, 1927.

4. Knaggs, R. L.: Inflammatory Diseases of Bones. William Wood & Co. New York. 1926.

5. Bowlby, A. A.: Diseases of Many Joints Probably of Syphilitic Origin. Med.-Chir. Trans. London. 77:43-56. 1894.

complete ankylosis. Manipulation, passive motion and any but the gentlest massage hastens fibrosis. The treatment except for maintaining the shoulder in abduction and external rotation is directed toward the etiology.

Cervical neuritis and radiculitis with referred shoulder pains need no shoulder manipulation. The diagnosis is frequently difficult. Spasm of the neck muscles and subsequent atrophy is more constant and of greater degree than changes in the muscles of the shoulder joint proper.

Brachial neuritis, with or without roentgenological evidence of cervical arthritis, is more tender at the nerve exits from the cervical spine and tends to produce pain radiating along the upper border of the trapezius and definitely down the nerve trunks of the arm. The median or circumflex trunk may be tender to palpation in the lower third of the arm.

Conditions Where Manipulation Is Indicated. We are assuming that the case comes to the surgeon in a stage after the acuity of whatever etiology has subsided and restricted motion is a long established condition whether or not all or only particular movements are persistently painful. An attempt to diagnosis the residual pathology aids in determining the prospects of successful manipulation and the degree of caution with which this should be undertaken. For this purpose four groups of cases may be distinguished.

1. The frankly post traumatic.
2. "Periarticular" conditions where trauma plays a role of varying importance.
3. Post reheumatic conditions.
4. Osteoarthritis.

Post traumatic cases have, in the author's experience yielded the most brilliant results to manipulation of any class of shoulder pathology. *If possible, movements must be instituted before* the organization of the plastic exudate occurs. Falls, either directly on the shoulder or where the force is transmitted to the shoulder through the extended arm, may produce a variety of *lesions without pathognomic signs of particular* tendon injury or bursal reactions. Young patients soon regain the normal motion after shoulder injury, but persons over 40 are likely to show an important difference in reaction. When the arm is bound to the side in a Sayre or Velpeau dressing after dislocation or fracture or even if carried in a sling after a minor muscle contusion cartilage injury or traumatic synovitis, fibrous replacement and cicatricial contraction in damaged muscle or joint capsule is the rule. There is no objection to, and every possible reason for, early manipulation of these as soon as palpable muscle spasm and tenderness have subsided. Thomas felt that a tightening of the entire joint capsule and obliteration of the well marked pouch of synovium which exists in the lowest part of the capsule when the arm is held at the side accounted in great measure for the early diffuse joint stiffness after trivial injuries. Colin Mackenzie,[6] A. G. Timbrell Fisher[7] and most other British orthopedic surgeons still agree with this.

Strains of Muscle Attachments. Pain in a particular muscle when it is passively stretched or actively contracted against resistance focuses attention on this injury. According to Jones[8] the "tender spot is the key to the situation. It is a small patch of effusion below the periosteum (at the muscle attachment) or in the fibers of the tendon which run in and through the periosteum. The pain is due to tension on this effusion caused by tension on the muscle." As the patient continues to hold the joint motionless and protective spasm of the particular and synergistic muscle groups continues, stiffness of the shoulder develops.

Sprain of ligaments follows a similar course; the region of the tenderness and pain on motion being diagnostic as to the ligament involved. As ligaments are notably stronger than the bones to which they are attached a fragment of periosteum may be pulled loose by traumatic traction on a ligament. The more extensive lacerations and ruptures of ligaments must be treated by immobilization at first. Some considerable fibrosis and attendant stiffness is inevitable. The only important decision involved is to determine the proper time for breaking these down. A forcible attempt to break these bands while the cicatrix is fresh and vascular and exquisitely tender to pressure leads to more effusion, hemorrhage, more patient has been fortunate enough to have been

6. Mackenzie, C.: The Action of Muscles. 2nd Edition. New York. Paul Hoeber, Inc. 1930.
7. Fischer, A. G. T.: Chronic (Non-tuberculous) Arthritis. New York. Macmillan Co. 1929.
8. Jones, R.: Military Orthopedic Surgery. Medical War Manual No. 4. Philadelphia. Lea & Febiger. P. 60. 1918.

treated with slight, gentle daily motion from the first day of the injury he presents himself weeks later with much less cicatrical pathology to deal with.

The typical traumatic arthritis is in reality the result of bruising or crushing of the articular cartilages of the humerus or the glenoid. Such an injury commonly results from falls on the outstretched arm. Typically a Colles' fracture has been sustained. The forearm is carried in a sling while the fracture is being treated. No attention is directed to the shoulder at first, as while the arm is immobilized the shoulder is not painful. Later when the splint is removed from the fracture and the patient attempts to use his arm pain is experienced on the first few degrees of motion of the shoulder in any direction. Spasm results if even slight motion is continued. In spite of physical therapy the shoulder grows worse. Cartilage is a non-vascular tissue. No true articular cartilage regeneration occurs. There is an area of active inflammation while fibrimous healing is taking place and intra-articular bands form. Manipulation followed by the abduction splint for immobilization and absolute rest yield excellent results.

The diagnosis of "scapulohumeral periarthritis of Duplay"[9] described as such by that author in 1872 may seem a step backward in terminology but defines nearly enough for our purpose a group of lesions often following trivial trauma and associated in varying degrees with an "arthritic tendency" where fibrosis results in the structures outside of the joint proper. When the arthritic moiety becomes quiescent these shoulders need manipulation to stretch the various contracted structures. Among these structures the commonest sites and types of pathology are in order of frequency, bursae, supra- and infra-spinatus tendons and fibrous bicipital tenosynovitis. Only the commoner entities can be described here.

Bursitis. For purposes of treatment the subcutaneous bursae are of no importance in this discussion.

The deeper bursae are of far greater importance in function and are capable of producing periarticular contractions and stiff painful shoulders. They may be classified as: (a) Subfascial, aiding the motion of fascial planes upon each other; (b) sub-muscular, which are between two muscles, between a muscle and some skeletal part, or between a muscle and a tendon; (c) subtendonous bursae, which are between tendon and bone, between tendon and ligament, or between two tendons; (d) periarticular bursae, like the bursae subscapularis which often connect with the contiguous joint. These deeper bursae are important as the location of much obscure pathology and mistaken diagnosis. The surgical approach is often difficult or exposes important structures so that operative removal is not always feasible without a destructive operation. Even after operation the stiffened shoulder still remains to be treated.

Being quite like the tendon sheaths and joint cavities in development and anatomy, the bursae mucosae present the same pathological reactions to trauma, infection and irritation as the former structures. In chronic bursitis, resulting from trivial trauma or repeated unusual motion, the question of a rheumatic element in the inflammation always enters the mind of the examiner.

Because of the complicated arrangement and contiguity of important structures, all chronic types of bursal pathology should be given the benefit of thorough and prolonged physical treatment before manipulative intervention is contemplated. For an intelligent approach to the treatment by physical means, the physician must visualize the probable pathology of the bursa and surrounding structures at different stages of inflammation. Deering has admirably classified these stages somewhat as follows:

1. Acute reactions with effusion or fibrin deposition beginning.
2. A chronic stage with fibrous adhesions forming and contracting with associated fascial fibrosis and sometimes periarticular fibrosis in the contiguous joint.
3. Muscular atrophy from spasm and disuse.
4. Calcium and fat deposition in the bursa or obliterative fibrosis. Sometimes the inflammation begins insidiously with no acuity, or stiffness of nearby joints, pain on motion being the first complaint. The early local treatment consists of heat, particularly diathermy, absolute rest of the part in a position relaxing pressure upon the affected bursa. Gentle massage up to the pain threshold maintains muscle nutrition

9. Duplay, S.: Traite' de Chirurgie. G. Masson. Paris. 1890.

and relaxes spasm. This, if unrelieved, would result in muscle atrophy and fibrosis. In the second stage, fibrous adhesions in the bursa and nearby tendon sheaths or between muscles must be prevented, even at the expense of some pain to the patient, by means of gentle manipulations and active stretching exercises to maintain joint, tendon and muscle movement. Heat is continued.

Often the case is seen first during the third stage, when the acuity has subsided but much associated pathology of muscle atrophy and fibrositis is already established. Besides the physical treatment already mentioned, forcible manipulation under gas is necessary, in graded operations. Assisted exercises follow the institution of voluntary muscle action.

In the last stage, when calcium salt or amorphous fat can be found in or beneath bursa, diathermy has an almost specific action in hastening its resorption. Manipulation should be advised only after resorption has been accomplished so far as possible by conservative means.

The chronic cases presenting no positive roentgenological findings are often mistaken for traumatic periostitis, neuritis, articular synovitis, a primary affection of nearby tendons or their sheaths or myositis. A definite diagnosis is imperative to make a decision between operative and physical treatment.

Bursae About the Shoulders. All types of inflammation in the various bursae about the shoulder joint are characterized by pain on motion of the joint, limitation of motion, and a tendency to hold the arm adducted against the side. It is difficult to make an accurate diagnosis of the bursae affected, the pathology and the etiological factors involved in this symptom picture. The subdeltoid or subacromial bursa is the most frequent of the structures outside the joint cavity proper to present lesions of traumatic or inflammatory etiology. A fall on the outstretched arm brings the greater tuberosity smartly against the acromion process. Continual exertion with the arm hyperextended irritates structures covering these bony processes in a less violent manner. If the patient has a tendency to synovial irritation from some chronic toxemia or allergic reaction affecting joint and synovial surfaces, less friction is necessary to produce serous or plastic reactions of bursal surfaces.

Codman[10] investigated the pathology of subdeltoid bursa reactions 23 years ago and described this bursa as follows:

"Its base is formed by the tuberosity of the humerus and the tendons of its rotators, which are inserted into the tuberosity. Its roof is formed by the periosteum beneath the clavicle, the coracoacromial ligament and the acromion and by the upper part of the fibers of the deltoid muscle. Its limits beneath the deltoid muscle vary considerably, but the outline is liable to be trilobar, like a clover leaf, and to extend below the edge of the point. On the whole, it is circular in outline, concavoconvex in shape and about the size of the palm of the hand."

The sensory nerves arising from the shoulder joint and from this large subdeltoid bursa, which may be spoken of as an accessory shoulder joint, go to the same cord level which supplies motor impulses to the muscles in close proximity to the shoulder joint and sensory irritation is reflected to these muscles as protective spasm, fixing the shoulder in adduction and slight internal rotation. On physical examination, the greatest tenderness is found either over the middle of the deltoid or over its insertion or distributed in both of these points. Pain on abduction may begin with the first few degrees of motion and be localized on the outer aspect of the arm at the deltoid insertion or suddenly appear at about right angle abduction, localized just below the acromion. No pain or tenderness should be expected in the uncomplicated subdeltoid lesion over the anterior border of the deltoid or about the bicipital groove of the humerus. In examining shoulder motion, it is an important item of technique for the examiner to seize the scapula firmly and prevent its rotating motion to replace the shoulder joint motion in the stiffened or painful shoulder. Codman's test of having the patient flex the spine forward, letting the arms hang down, then arise bringing the arms up to the horizontal with the body, is important. When this maneuver is performed a sharp pain is generally experienced in the shoulder when the erect position is resumed and the humeral head is brought up against the acromion. Codman has lately decided that chronic post traumatic bursitis is not a primary affection

10. Codman, E. A.: Obscure Lesions of the Shoulder; Rupture of the Supra-spinatus Tendon. Boston Med. & Surg. Jour. CXCVI, 381. Mar. 10, 1927.

but secondary to partial or complete rupture of the supraspinatus tendon or degenerative changes, notably calcification in this tendon often combined with similar changes in the infraspinatus tendon.

In 1906 Dawbarn[11] described a sign rather characteristic of proliferative changes or calcium deposition in the supraspinatus tendon in studying subdeltoid bursitis, but Stevens, in 1909, first recognized a distinction between this and subdeltoid bursitis proper. The sign mentioned consists of a point of tenderness just above the tuberosity of the humerus, which disappears under the acromion on extreme abduction of the arm. This is rather constant in calcification of the supraspinatus tendon. In lesions of this tendon, internal rotation and abduction is more painful than external rotation and abduction which latter is more painful in the subdeltoid affection. An x-ray taken with the arm rotated outward, the tube directed from a position close to the base of the neck and directed downward and posteriorly may show the supraspinatus pathology, while an ordinary antero-posterior flat plate visualizes the subdeltoid bursa clearly. The distinction is subdeltoid and supraspinatus pathology from the standpoint of treatment is an important one, since chronic inflammation in the former yields much more readily and uniformly to diathermy and the abduction splint than the latter, which gives a much more hopeful prognosis of function return after early operation for removal of the pathology in the tendon followed by manipulation. Harbin finds the area of degeneration and calcium deposition often entirely limited to the tendon at operation without any associated changes in the subdeltoid bursa. The tissues within and beneath the deltoid muscle share with those about the elbow joint in a characteristic tendency toward calcium deposition after injury or irritation. Schuyemoff[12] found that calcium may be deposited in the deltoid muscle fibers within 36 hours after suture of a laceration of this muscle. Calcium deposition often proceeds rapidly with a tendency to fibrosis, making any shoulder injury particularly likely to result in early stiffness and limitation of motion.

Tenosynovitis of the long head of the biceps presents a tenderness far anterior, under the deltoid and along the bicipital groove. External rotation and extension of the shoulder are painful as is bicipital action. Local crepitus may be present. Manipulation cannot be performed without danger of a recurrence of tenosynovitis until several months after the bicipital groove tenderness and crepitus and topical pain on bicipital function have disappeared.

Coracoacromial, subscapular and infraspinatus bursitis are rare and the tenderness is localized and not adjacent to the subdeltoid tender points. The former may be located under the coracoid process in front, or farther anterior, beneath the conjoined tendon of the coracobrachialis muscle and the short head of the biceps. The subscapular bursa lies between this muscle and the joint capsule with which it typically communicates and inflammation rarely involves this or is diagnosed separately from disease of the joint proper.

Periostitis of the humerus at the deltoid insertion may be traumatic from forcible deltoid action or associated with myofascitis here. Abduction is painful, but no other signs suggesting subdeltoid bursitis are present. X-ray may show a local roughening or exostosis of the cortex. These yield slowly to diathermy, but shoulder joint motions can easily be preserved.

Conditions Following "Rheumatism." The profession must at the present approach the consideration of all "rheumatic" conditions with "an humble and a contrite heart." Our conception of chronic "arthritis" and "rheumatism" is for the purpose of the present consideration that of Garrod[13] (1890) who recognized two types. The first he christened "rheumatoid arthritis," while to the second he gave the name "osteoarthritis." Various other classifications need not confuse us here. By the first we choose to mean tendency to partial fibrous ankylosis which appears insidiously or follows often the most trivial mechanical trauma. Often there is a history of chronic or recurrent muscle or fascial involvements (Albee's myofascitis)[14] or prior attacks of

11. Dawburn, R. H. M.: Subdeltoid Bursitis. A Pathognomonic Sign for Its Recognition. Boston Med. & Surg. Jour. 154:691. 1906.

12. Schujenioff. Quoted by Moschovitz. Histopathology of Calcification of Supra-spinatus Tendon Associated with Subacromial Bursitis. Am. J. M. Sc. 150:115, 1915.

13. Garrod, A. E.: A Treatise on Rheumatism and Rheumatoid Arthritis. Philadelphia. Blackiston Sons & Co. 1890.

14. Albee, F. N.: Myofascitis. Pathological Explanation of Many Dissimilar Conditions. Am. J. Surg. 3:523-533. Dec., 1927.

rheumatic fever. Seldom the history points to no incriminating polyarthritis and the patient has through his entire history a mono-articular lesion. The etiological theories of focal infections and autointoxication of the intestinal organ are of course quite well known.

Pain on active or passive motion in every direction and decided and general shoulder muscle spasm on attempts at motion are both conspicuous and constant symptoms. The third important finding is muscle wasting not particularized to a muscle group and of greater degree than in any other type of shoulder pathology with which we deal. "Nerve lesions," of course, produce an extreme wasting but limited to the involved innervation. These symptoms and the history make the diagnosis. Roentgenological findings seldom give positive assistance. As Pemberton[15] states, "It is clear that arthritis and its accompanying phenomena may exist for many months without resulting in evidence x-ray can detect." His roentgenological studies were based on 400 cases.

In cases of residual stiffness after the arthritis has "burned itself out" we are squarely confronted with the question, "Shall I immobilize" or shall I permit motion in this joint? Only experience with such cases and experimentation with the particular joint can tell us which one to manipulate after the manipulation is tentative. If a marked reaction follows immobilization, heat and massage must be instituted for several weeks and another manipulation attempted later. Certainly little harm is done by this tentative approach.

Osteo Arthritis. Entirely satisfactory results are uncommon in this class of affections. The diagnosis is not usually difficult. Symptoms appear insidiously, often following over use. Trauma has little or no effect in the evolution of the disease. A dull ache is first experienced on motion and slight tenderness exists along the joint line. Ordinarily the muscles are not wasted in proportion to the joint pathology. The stiffness may be restricted only in the last few degrees of motion, one motion not being more affected than another. It is a general rule that osteoarthritic changes are less marked in the joints of the upper extremities than in those of the lower. The hypertrophic type of reaction may be almost entirely absent due to the fact that hypertrophy is a compensatory reaction and as one expects is greater in the joints of the lower extremities which have to bear the weight of the body. In the roentgenogram, lipping of the joint edges is rare and when it does occur it is not extensive. This is fortunate for purposes of manipulation as it is unusual to find enough bony changes around the joints to be the cause mechanically of the loss of joint motion. Areas of rarefaction vaguely suggesting cavities may be seen in the head of the humerus or the head may assume an ovoidal shape. Sometimes earliest x-ray finding is blurring of the acromioclavicular joint.

Those who have faith in the infectious origin of these conditions may treat various foci infection or absorption of toxins but physical therapy often yields a more satisfactory result. However, manipulation can be tried and can be repeated with greater force if any improvement is attained. Gentle manipulation sometimes yields surprisingly good results in a patient of advanced years who has developed a tendency to fibrous replacement of the skeletal muscles in association with only a low-grade change in the particular shoulder joint.

TECHNIQUE OF GRADED MANIPULATION

By manipulation of the shoulder joint followed by maintenance of the joint in a position of rest and muscle balance, the following physiological results are obtained:

Relief of muscular spasm by the new position.

Increased circulation in periarticular structures.

Increased absorption of exudates for bursae and the joint by—

Breaking up intra-articular and intra-bursal bands and pockets.

Preliminary preparation or treatment can be divided into remote and immediate. By the first is meant a thorough course of baking and massage to promote circulation and relieve edema and fibrosis as much as is possible by this conservative treatment. This procedure leaves the examiner able to ascertain exactly which movements are persistently painful and restricted. He should make written notes of the exact degree of passive and active abduction, internal and

15. Pemberton, R.: Studies on Arthritis in the Army Based on 400 Cases. Arch. Int. Med. 25:231-281. April, 1920.

external rotation possible at this time to check with his findings as to movement when the patient is anaesthetized for manipulation. This conservative treatment should be continued until no further progression in improvement occurs.

Immediate preparation consists of the application of hot, moist dressings with the shoulder in the greatest possible abduction the patient can endure for four to six hours.

At the first manipulation under gas (preferably ethylene) only one motion can be attempted. When the operator, who has slowly attained a slight improvement of motion by weeks of baking and massage, finds he can accomplish all movements by force, after the patient is anesthetized, he sometimes feels an almost irresistible impulse to pump the arm up and down and rotate it forcibly in all directions until passive motion is complete. This is often possible but has calamitous results. A more complete spasm ensues, ruptured fibrinous adhesions are replaced by fibrous bands and the loss of function is greater than before the treatment. Kneading of the structures which feel tense should accompany the manipulations. When spasm in a muscle still persists, if the part is held immobile and "on the stretch" for two or three minutes, the spasm will quite surprisingly relax and further motion can be accomplished.

The one motion attempted at the first maneuver should be abduction and this by a "coaxing" motion and only until one notable tearing of shortened structures is felt or heard. This snap which the osteopathy calls "reduction of a subluxation" may be due to stretching of a folded joint plica, release of a fibrous shortened tendon or ligament or tearing of an intra-articular or bursal band. Stop here and apply hot dressings with the hand tied to the head of the bed, securing maintenance of the maximum abduction obtained.

A commonly overlooked principle underlying the efficacy of this treatment lies in the fact that a joint is endowed with remarkable powers of repair and that these powers are often proportional to the motion permitted in the joint; that they depend on function rather than on rest of the part. A striking characteristic of various types of chronic arthritis, traumatic or otherwise, is the observation that stiffness is aggravated by rest and becomes less marked after exercise, a use of the affected extremity provided such exercise is not excessive. On awakening in the morning the stiffness is greater than it is later in the day after even minimal use. If manpiulation has been properly performed one rarely finds the patient complaining of spontaneous pain on the morning following the maneuveur. Nevertheless, hot fomentations are again applied.

In two or three days if abduction is not now complete, finish it under anesthesia. During each manipulation the scapula must be grasped firmly with the left hand to prevent scapulothoracic movement which might deceive the operator expecting to establish scapulo-humeral abduction. After another waiting period, secure complete external rotation in one or two stages. As the last step, complete internal rotation once forcibly but put up the arm thereafer in the airplane splint and allow the patient to leave the hospital wearing this with the arm in abduction of 90 degrees or a little more and complete external rotation.

Physical treatment must follow this manipulative series for several weeks, at each seance the splint being removed and adductions and rotations being performed after baking and massage. In the author's experience, the motions of extension (or retraction) and flexion (or protraction) will be secured without special manipulation or after treatment if complete rotation and abduction are re-established.

One occasionally hears members of the medical profession intimate, during a discussion of the value of manipulation, that there is something yet to learn, some secret principles of manipulation handed down outside the ranks of regular practitioners which they cannot acquire. As a matter of fact, the principles of manipulative interference are very simple. As Sir Robert Jones has succinctly put this in his Cavendish Lecture, "Let me emphasize the statement that there is nothing which the manipulator (osteopath) does which cannot be more safely undertaken by any practitioner (of medicine) who possesses a knowledge of the pathology and elementary anatomy of the joint, but he must become familiar with the methods of manipulation which are safe and thorough—let it be fully realized that there are no hidden or mystic rites in any "bone setting."

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NEW PHASES IN PEDIATRIC MEDICINE*

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Twenty years ago, whenever a group of pediatricians met, the discussion centered around the question of the latest advice that was to be given in infant feeding. With age and experience has come toleration and wisdom. No longer do we discuss whether this man is right or that man is wrong, because we have come to recognize that there are many different ways of feeding infants and all of them correct. In other words, the normal child will take a great variety of food and thrive on it.

Certain principles are necessary. The properly trained physician finds it a comparatively simple thing to bring up a baby from the nutritional standpoint alone. Simple formulae are quite sufficient to meet the needs of at least 95 per cent. of the children. It is only at the most 1 per cent. who need expert advice. I do not mean by this that the physician is not a necessary agent in prescribing the dietary for an infant, but I do mean that it is not a difficult task for a physician, who is in any way equipped, to undertake this responsibility.

Of course, when we speak of the nutritional side of an infant, we must realize that there is an emotional side also. Someone has said that our American teaching of infant feeding has led only to loss of appetite, and to a certain extent such statements are justified. It is the insistence on the part of the laity, and oftentimes of the nurse, that the child must measure up to a certain set standard of height, weight and age that has brought about a certain psychical reaction, the result of which is seen in the child's refusal to accept the food put before him. The vicious circle is then established. If the mother had been taught that the child should have only a moderate supply of food, as a baby should, probably we could overcome much of the difficulty in feeding it.

I have come before you today, however, not to dwell upon these age long difficulties of pediatric practice, but rather to set before you some of the things which are agitating the pediatric world at the present time. There is no branch of medicine that is turning out better scientific work nor perhaps more of it in the United States than is being turned out by the pediatricians at present. However, the social side of pediatrics is to the fore. The recent White House Conference has brought with it many problems, problems which cannot be settled by you and me. Many of them need much longer and deeper study than has already been given before they can be worked out. Nearly all of them require co-operation of many different groups if they are to be worked out properly. May I take your time to discuss with you some of these problems that are being presented to the pediatricians today?

Medical Education Not Meeting Responsibility.—We must first know about ourselves if we are to be of any value in helping others. Therefore, a rather thorough survey of the physicians themselves and of their education was made. It became very evident from these statistics, as many of us had previously suspected, that the medical school in this country is not fulfilling its duty to the public in respect to the education of doctors who practice among children. Whatever may be the cause for this, the fact is still very evident. Medical schools in the past have had no appreciation of preventive medicine when it demands individual attention. This is one phase of pediatrics which is most neglected in our medical teaching. As you doubtless know, there is no branch of medicine which comes in contact with the public health work as does pediatrics. Consequently, it is of the greatest importance that our medical schools realize this and remedy the defects. The difficulties are only too apparent. In the first place, the medical curriculum is already overcrowded. Whether that could be changed to advantage or not is not for me to say. Nor is it for me to say that one branch of medicine is more important than another. But the medical schools must find a way out or else not only on the medical schools, but the medical profession as well will fall the censure of the community.

The great hue and cry among health workers is that the average physician does not care about practice with children. This is especially true

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with infants. That a certain amount of criticism is justified, no one can deny, and one would question whether this criticism were exaggerated if one reads Dr. Veeder's report on the schools of this country. Unless we can remedy this primary defect, we must propose to have much of the medical work among children taken over by public agencies and frequently superintended by laymen. To my way of thinking, this would be a very serious fault. Only one who has gone through the long years of preparation for medicine realizes how such preparation is necessary to have the proper outlook upon any medical situation. If we cannot employ our physicians in preventive pediatrics to the full extent, then in just so much are we going to deprive our children of the advantages of the greatest of health boons. This is a more serious situation than at first appears, because the psychology of the average physician centers about disease and not about health, and the only large groups of physicians who are interested in health are the public health workers and the pediatricians. I tell you this because I wish you would realize the difficulties with which we have to deal.

Hospitals Short on Pediatric Facilities.—When we view the hospitals of this country, we find that they have probably sufficient beds and bassinets for children. It is the exceptional general hospital, however, that has a well rounded out pediatric service. Most of the hospitals, even though they have staff appointments in other lines, have no pediatrician on the staff. This is serious for many reasons. In the first place, the children who go to these hospitals have not the intelligent supervision which is necessary to protect them from conditions in hospitals peculiarly disturbing to the young patient. Problems of the child in the hospital are decidedly different from problems of the adult. The situation is also peculiarly serious because of the fact that in many communities the hospital is the rallying place for physicians; where they get together and discuss their interests, medical and social. If there be no one to present the pediatric viewpoint, no one to take the part of the child in that hospital, then we are far from a consideration of the care of the child in that community by the medical profession.

It is not surprising that the average hospital does not have a large children's service because a children's service never pays, and after all, hospitals must be supported. Nearly eighty per cent. of the children who go to the big general hospital are free or part-pay patients.

Serious as this situation is with respect to the doctor, with respect to the training of nurses it is far more so. It may be said of the doctor that he has already had his training and that while it is inadequate, at the same time he has at least a knowledge of the subject.

But what of the nurse who is trained in the hospital without a properly conducted children's ward? Some of them, you say, will go to a children's hospital for that service. I grant you that. But most of them will have no such opportunity, and the nursing care of children is as distinctive an art as is their medical care.

Public Is Lethargic Toward Prevention.—When we pass from these measures which affect the profession largely, and which indirectly contribute to our deficiencies with respect to the laymen, we come to a situation which is quite a serious one. Do people in the United States realize that there are fifty thousand cases of smallpox in this country every year? While at the present time the death rate is low, there is no telling how or when we may have an epidemic which would be fatal to large numbers in the nation. The United States is second to India in the number of smallpox cases occurring within its borders. Why? The answers to this would probably be many. A survey made by Dr. Palmer and reported to the White House Conference showed that only about five per cent. of our rural and thirteen per cent. of our urban population under school age had been vaccinated. The situation regarding diphtheria is not very much better. Whose fault is it? Certainly our public health authorities have done everything they could to have this corrected. The medical profession is fully alive to the situation. The fact that these two groups have not gotten together to carry on these necessary protective measures accounts to a large extent for the failure to have this accomplished. Where there has been intimate cooperation between the medical profession and the health authorities, much has been done. Where this cooperation has been lacking, little has been ac-

complished. The sooner both sides can see this, the quicker will the situation be remedied. Neither side is without blame. Neither side but has its proper arguments. Attempts have been made to remedy this condition with some success. This is not a matter of knowledge. It is a matter of administration.

Health Teaching in the Public Schools.—We turn now to the public and private schools. We find here another situation which needs intensive study. How much should the state do in the examination and care of school children, and how much should be left to the private physician? To show you how little the average layman knows about medicine, and how little he estimates what the physician's work requires, I would like to relate to you a recent experience. It occurred in Seattle, Washington. I was about to bid good-bye to a physician there who is a leader in the pediatric profession. He came out of his office very much disturbed. He said to me:

"Do you know what these people are proposing? The Tuberculosis Society has sent its nurse here to request that the pediatricians of Seattle examine all high school children to determine whether or not they have tuberculosis."

Now to these good people who constitute the Tuberculosis Society, this seemed perfectly rational. They did not realize for some reason or other that doctors have to work for a living. That is an omission on the part of many laymen. But that was really not the serious part of the situation. The serious thing was that they did not realize how extensive an examination must be in order to fit the situation. It is a comparatively simple thing to take a sick individual and find out what is wrong with him, but it is quite another thing to take a well individual and assure him that he is perfectly healthy. Suppose a mistake had been made either way. Suppose some child had been told he had tuberculosis when he had not. That would have hung over him for the rest of his life. Or suppose some child who was affected with tuberculosis was assured he had no tuberculosis. That too was serious because he would have taken chances. Think of the responsibility placed on the shoulders of the physician. This may be an extreme case, but at least it shows the gravity of the situation.

There is another phase of public health as it affects school children, however, which is perhaps even more important, and that is the public health or hygiene that is being taught them in schools. How many teachers of hygiene in our schools, public or private, have had adequate training to teach this? What are they teaching? I am not myself familiar with this situation, but I have talked to some people who are, and they are all persuaded that there is a tremendous amount of trash poured into the minds of these young individuals under the guise of hygiene.

We have never gotten away from the stage of my boyhood when cancer of the stomach was displayed in beautiful colors as alcoholic gastritis. Such errors are not made now, but some almost as glaring are. It will take years of study and the most intimate cooperation between the medical men and educators to remedy this situation.

Medical Education Is Basic.—We see therefore that the pediatric branch of the medical profession has its hands full in the consideration of many difficult problems of a social nature. Some of these may be met in one way, some in another. The basic problem, so far as we are concerned, is medical education. Unless we can persuade the medical schools of this country to give proper education in preventive pediatrics, our problem is immeasurably delayed in its solution. None of these difficulties, however, are insurmountable. It is the part of wisdom to go slowly in order that we may build a firm foundation for future effort. Public health officials and the medical profession must get together on a common ground. The position of the private physician in charity work must be definitely defined. The public should be informed as to the amount of work done for the state by the private physician. This work if translated into dollars and cents represents far more than the combined charitable efforts of all the rest of the population. Nor must they forget that in taking away remunerative returns from the medical profession that they are digging the grave of that profession. They cannot replace this with heavily endowed institutions, nor with well equipped hospitals. There must always be a large group of the medical profession who are free to estimate the value of new discoveries and to formulate their application. There is grave danger of this

situation developing and for the good of those very persons who would develop it, we must combat it.

We must not hasten into the formulation of a course in hygiene for school children, but we must consider this from all sides. We must consult with those who are interested in education and we must evolve from this cooperation a means of education of the child which will interest him and at the same time be correct in the data which it provides. We must make the hospitals see that it is to their advantage to have pediatricians on the staff and that it is necessary to have a proper training for nurses in this branch of medicine. We must point continuously to the dangers of smallpox and diphtheria and urge the early immunization for these diseases. Much can be accomplished if we work together, very little if we work separately.

Nearly every problem along this line has its medical aspect. The pediatricians of this state and other states are more than willing to give of their time and advice so that these problems may be properly answered. Above all, we must not go too rapidly, for half truths are untruths. We must be sure of our ground before we proceed; in other words, the pediatric profession is ready and willing to proceed along sane lines for the betterment of children, whether it be their minds or their bodies, but this procedure must be sure and it must mean a cooperation of all forces in this work which is so much in the hearts of all of us.

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DISCUSSION

R. C. Cook, M. D., State Department of Health, Springfield, Illinois: Doctor Grulee's paper is refreshing because it comes from the hand of one who visualizes an ideal hoped for even though not yet achieved; it is inspiring because it represents a torch bearer in search of a better approach to a satisfying childhood. And who is better able to speak for the pediatricians of America and the children of America than Doctor Grulee?

Regarding infant feeding, it is true that twenty years ago, even ten years ago, the subject of infant feeding occupied about all the "open spaces" in pediatric discussion and writing; the same is too nearly true today. No doubt this is accounted for by the excessively high infant death rate of twenty years ago and especially as related to the artificially fed infants. Marasmus, dysenteries, summer complaints—all associated with feeding—took an alarming toll from the ranks of little children. Pediatricians wrangled over the virtues of the various infant feeding formulae—the percentage method, the caloric method and others—and still infants died in great numbers and on any and all formulae. But as pointed out by our essayist, babies of today thrive on almost any formula, and this happy result is achieved no doubt by the cooperative efforts of several groups as will now be indicated:

1. Pediatricians are now quite well agreed on the quantity of food a baby needs and the feeding schedule.

2. Pediatricians as a group have been so thrilled with their accomplishments that they have radiated enthusiasm to the general practitioner and he in turn has become interested and informed on the subject of infant feeding.

3. We have better informed parents; a more exacting public opinion; and a better appreciation for the laws of hygiene and sanitation—pure milk, safe milk, pasteurized or boiled milk, and sanitary feeding bottles. We practice better general hygiene on the baby (bathing, cool comfortable clothes, freedom from flies and other insects, restful sleep, etc.) All of these factors have entered into the solution of the feeding problem.

With the feeding problem largely out of the way, our horizon has cleared enough so that we can see the child as an individual (a whole child). In earlier years we were content to have a live child. Now we are satisfied with nothing less than a perfect child, a happy child and a potentially useful future citizen which brings us directly to a consideration of the "newer phases" of pediatric practice with which Doctor Grulee has so vividly brought us "face to face." He set up for us the two outstanding and fundamental problems affecting childhood which are yet unsolved. They are:

1. The social phase of pediatric (childhood) practice, and

2. Health teaching in the schools.

The magnitude of these problems is best expressed in the essayist's own words when he says, "These are problems which cannot be solved by you and me." It will probably take more than one generation to even approach a satisfactory solution.

Problem No. 1. We have reduced the infant death rate in Illinois to the low point of 55.8 deaths per 1000 live births, but for the 945 who live we have not evolved a plan that guarantees to even a majority the expert guidance that is so much needed if they are to achieve optimal development. Far too great a number do not have the advantage of medical supervision, parental understanding and community interest that contribute so much to the building of a perfect child. Society is now demanding a solution to this problem, and as I see it there is only one solution based on the following principles that will fulfill the American ideal.

1. Physicians and all informed parents recognize the fact that the best medical service and guidance is rendered by the individual or family physician to his patients.

2. It is within the province of the family physician's rights to assume responsibility for the child's health from birth and at least throughout the school years. (I frequently see mothers with babies, artificially fed,

and even though the baby is not doing well, they often have not consulted their doctor for three to five months. This is true because their doctors have not sufficiently impressed them with the importance of scientific child care.)

3. It is the family physician's duty and responsibility to advise his families regarding immunization against preventable diseases and encourage, even insist, that children be immunized at the proper age.

4. The informed parents will appreciate, they do appreciate, the physician who assumes this personal interest in them and they respond accordingly.

5. The response of the informed families will through example reach all.

We look to the pediatricians to set up for us the standards; to the medical schools to train physicians not only in children's diseases but also in child understanding; and to the community to take more general interest in child life.

As stated by the essayist, it is frequently charged that the medical schools give too little time to pediatric teaching. Pediatricians frequently urge that medical schools should give as much time to teaching children's diseases as they do surgery, and it seems only reasonable that they should since every doctor practices pediatrics while only a minority of physicians practice major surgery. It is estimated that children's practice makes up about 30 to 35 per cent of a doctor's work.

Problem No. 2. We come now to a discussion of the section of the paper relative to public and parochial schools—the question of physical examinations and health teaching in the schools, a subject with which I have had a fairly close connection for ten years.

Regarding the school child's medical and dental examination, we know how important it is to the home, the school and especially to the child to have this appraisal; we also know that it is equally important that this examination be made an office routine, making use of all modern aids to diagnosis when needed. But it is only one school out of a thousand or perhaps many thousands that has this service. In most schools the neglect of any sort of examination is so evident that even a hurried and superficial examination is often instrumental in getting some of the most urgent cases to a doctor or dentist.

We appreciate how little knowledge lay groups have of disease and diagnosis when they ask that a doctor examine a high school group or a grade school group to determine whether some may have tuberculosis; yet this is frequently done. We frequently hear from school boards that because some janitor, teacher, or pupil has had tuberculosis they wish the examination of whole groups. They do not know that to do such a job would require weeks of observation, tuberculin tests, X-ray plates, etc. The most good that can come from such examinations at present is the opportunity it gives the examining doctor to talk nutrition, encourage a hygienic life, and enlist the interest of the pupil and the group in personal health and physical development, and encourage the pupil to go to his doctor for a thorough examination. *The ideal will never be reached until "children are their doctor's patient from birth and on throughout the high school period."*

We have had innumerable sporadic attempts by individuals and groups both within the school and without the school to teach health. These attempts, however rash, at least served to hasten the day when the National Education Association and the American Medical Association appointed a joint committee of specialists to set up in detail an outline of objectives in Health Education which they did in 1924. It is true that many teachers never heard of this outline and many teachers are poorly equipped, or not equipped at all, to teach health, but we are somehow finding our way. As far back as 1918 a commission was appointed by the National Education Association to reorganize the curriculum in secondary education. In their report "Cardinal Principles of Education," health was placed first in a group of seven objectives. The situation today is: We find a majority of teachers in all schools—rural, village, and city, teaching health, many of them teaching it well; the poorest teaching it as good as the average of fifteen or twenty years ago when our only method was text book teaching and recitation in hygiene and physiology.

Our teachers today teach *health education* understandingly, teach it as a living subject, not primarily something to be learned but as something to be done. It is an activity program and the reward is not so many gold stars and then a certificate but satisfying outcomes, such as clean body, restful sleep, erect body, good muscles, winning ball teams, etc. Health teaching as I find it in the schools today adheres quite generally to the three recognized fundamental principles set up as the *aims* in teaching this subject:

1. Formation of desirable habits.
2. Create favorable attitude toward the activities done.
3. Information or knowledge of why they do the thing.

It is my experience that the weakest point in teaching Health Education today is the failure of teacher or principle to set up definite objectives for each grade. This, I believe, is more often true of Health Education than of other subjects. I wish here to interpose a quotation from a text book, "Curriculum Principles" by L. Hopkins, Columbia University, regarding "objectives."

"A teacher without an objective is similar to a traveler with no destination in mind."

"An objective is as essential to a teacher as an engineer is to a locomotive."

The teacher of Health Education the same as the teacher of any other subject should have a much broader knowledge of the subject than she is called upon to teach.

In support of my contention that Health Education is for the most part well taught, I wish to present evidence of an activity program in Health Education from the little mining town of Pocahontas in Bond County. This material is from the fifth and sixth grade room and came to our office only this week.

Their principal help and inspiration is their teacher whose qualifications are no better than many others but whose initiative to create and ability to evaluate material and to recognize teaching situations deserves special mention.

One of the health activity programs of the grades referred to above is the publication of a four-page weekly bulletin under the caption THE HEALTH NEWS. This little paper is neatly printed by hand, and then by the use of a hectograph machine the desired number of copies are made. Listed as editorial staff are editor, assistant editor, fifth grade reporter, sixth grade reporter, health and exercise reporter, cartoonist. It is required that each pupil make a contribution to the paper.

After all, the learning we get must come to us through activity. The reason I wish to introduce this one pet little scheme is because I believe it is quite representative of the work being done in many of the schools of the State. It is my personal opinion that some of the best health work done in Illinois is done in the little village of one thousand or fifteen hundred people, where the health program can be made a center of commmunity activity.

That makes me think of a certain town in Southern Illinois where I asked the teacher whether the children, when absent because of illness, have a doctor's certificate before they return to school. He said,

"Yes, they do. My pupils would feel humiliated if they returned to school after being sick without a doctor's certificate, and the other children would make them feel that way."

I thought that was a good way for the children to be taught.

Mrs. N. G. Symonds, Illinois Congress of Parents and Teachers, Hinsdale, Illinois: I am very much interested in Dr. Grulee's paper, because representing a lay group in the State of Illinois and members of a national organization which is undertaking a definite program in health education, there is one point I would like to bring out as a member of a volunteer organization, and that is the fact that the language of professional people is really quite profound. When the medical people begin to cast their terms in simple language I believe they will get closer to the real people.

I feel this strongly, for I am a housewife and mother, principally. My vocabulary differs from the young people and the grown-up child. Now that the children have grown, I find myself having to learn the language of not only my son's business but my husband's profession. But I would like to have the medical profession revise its vocabulary so that we can understand them more readily.

We are very eager to be of service in this educational work. We have a definite program in the parent teachers association throughout the country, but we are a lay organization and our primary effort is to bring about a better understanding between the lay people and the medical people.

This word "ethics" carries a great anxiety on the part of the medical people. That is a fine word, and quite as important with our people as with the professional people. Part of our program is to bring about a better understanding of this word ethics, for we know you could not have possibly gone so far in your work if you did not have that splendid word of ethics. Individually, we are ethical, too, and we who are leading this parent-teacher organization in Illinois are striving to bring about a better understanding of this word ethics and re-establish the relationship between the individual and his dentist and doctor.

We have an interesting program outlined. We are stressing, as Dr. Cook says, the immunization and vaccination among the children, the actual dental examination, annually, and the pre-school medical examination of children. We, too, are urging a wider use of the health record cards. I believe the report from the White House Conference shows that there were more varieties of record cards found in use than of any other form. When we start in with this preschool examination, we find we must begin with the record card and have it on file where it can be followed up. If we have these records of the children, we will have something to check up on. I believe in record keeping, for it is after all the health history of the children in the public school system.

There are five things we are drilling upon in the movement in the parent-teacher organizations of Illinois. Immunization, vaccination, examinations, preschool training and health record cards.

However, we are a volunteer organization and need help and guidance. We are a great channel for this work to be carried out through, this work of child protection. I believe we have been comprising the audience wherever these White House Regional Conferences have been held. Our field is child welfare. We believe we need the help for the children more than anything else. We hold no brief for our position except as a lay group, tremendously interested in bringing about a better understanding between home and school, and after all health is the foundation.

I think if there was one lesson I learned from the great conference in Washington last November it was that we should stimulate the organizations that already exist, and that is a fine thing. These reports handed down to us by the experts in the field have brought together the most complete set of reports ever compiled. They say that since the war period when Hoover called together his splendid men for work in research and food values, there never has been such a group of people brought together whose sincerity or purpose was so great as at this White House Conference, and we feel that we (parent-teacher associations) are the direct channel to carry out these plans.

I believe that if we can strengthen the organizations existing today, the high value of cooperation will result almost automatically. We find that Doctor Hall is one of our best friends. There is no problem we cannot discuss with his office or staff in the hygiene department, and Dr. Hall himself.

I am asking today from the medical people a greater degree of the feeling of trust and belief in our organization. We propose to educate and not try to reform

the work of practical medicine but to educate our lay people to a better understanding of the life before them, the opportunity of establishing a more profound and more substantial health consciousness.

O. E. Ehrhardt, M. D., Springfield, Illinois: I have enjoyed both papers greatly. I feel that today the public is rapidly becoming educated in public health and preventive methods and medicine. People are demanding that we take the leadership in the dissemination of this information, and it is up to us as physicians and public health workers to get behind these other organizations.

Through conferences, most of the public health work and most preventive medicine is done by pediatricians and public health workers. But the example of the sheer lack of immunization in diphtheria and smallpox indicates that we as pediatricians and as public health workers cannot do all of the service required. I think it is more important that we carry the ideas to the general practitioners and get their cooperation. After all, more than two-thirds of the practice of the general practitioner concerns women and children, and it is up to him to disseminate all the information we have to the children and to the parents who in turn can make use of it. That is particularly true in preventive medicine.

I feel that while it may take a long time and will necessarily mean some change in the curriculum of our medical schools, and will mean further education of those doctors out in private practice, certainly in the rural districts, this sort of thing is going to have to be done before we put over in any large measure our preventive measures.

Andy Hall, M. D. (Chairman), State Health Director, Springfield: As evidence of the need of education on public health measures I wish to cite an incident which occurred the other day. One of the district nurses called upon the county superintendent of schools in one of the counties. Just as she was leaving, he called her attention to the fact that his wife read in some paper or journal the night before that children could be protected from diphtheria by immunization!

Only a few years ago a faculty member of the Harrisburg High School, at Harrisburg, Illinois, desiring to find out what information high school pupils had of some of the ordinary medical subjects sent out a questionnaire to fifty high schools in Illinois, Kentucky, Tennessee and Indiana. From the replies it appeared that 59 per cent of the students believed malaria is caused by drinking polluted water, and not by the bite of mosquitoes. Twenty-six per cent believed that the proper cure for rabies is a mad stone applied to the wound caused by the dog-bite. Twenty-three per cent believed that a horsehair placed in a bottle or receptacle of water would cause a horsehair snake.

A stream can rise no higher than its source and until our teachers in their public schools have some better knowledge along the lines of preventive medicine, we shall still have high school pupils in comparative ignorance concerning many of the ordinary things in preventive medicine.

Dr. Grulee's Closing Remarks: I was a little afraid my talk on school hygiene would be misleading, or misinterpreted. I am strongly backed up by our Chairman's discussion, however. I have no fault to find with what has been done to help the children along in their quest for health, but I do feel that many things have been taught which are not justified. When 300 of the best scientists in this country go down and discuss hour after hour and day after day the fundamental principles of physical hygiene and come to the final conclusion that there are only a few things they really know, then I think it is rather a hard thing for a teacher to tell the pupils what they should do.

We must get a lot of scientific facts before we can present them properly to the children. We must not take the radio ballyhoo as a textbook for teaching children. I suppose people in this room, all of them, feel that the basic thing to do for children is to give them milk at recess. As a matter of fact, scientific work has proven it is much better to give them orange juice. I suppose our dairy farmers would kick about that, but that is really true. The question is whether you would not be better off not to give them anything at all in the majority of cases. There is an occasional child who needs it but not many. That is just by way of example.

LEGISLATION IN THE INTEREST OF VETERANS*

H. H. Shoulders, M. D., F. A. C. S.
NASHVILLE, TENN.

I wish to express appreciation of the honor implied in your kind invitation to come up here. I would also like to pay my respects to Mr. Hayes, who is unfortunately absent. I have had several contacts with him during the past year. I have had contacts with no one who has impressed me more with ability and sincerity. I join the doctor in the desire that affairs will so shape themselves that I will be permitted to cast a vote for him for national commander of the American Legion.

I have experienced a deep sense of satisfaction as I sat here because of the surroundings. On my right is a representative of the Medical Association and a representative of the Veterans' Bureau. On my left is a representative of the American Legion. I happen to be a member of all three organizations.

Prior to last year the American Medical Association and the American Legion were shooting

*Address at the Veterans' Luncheon, Illinois State Medical Society, Springfield, May 17, 1932.

at one another at long range. I say long range because neither saw the other's viewpoint exactly. Each was shooting blindly in a sense. So I experienced great satisfaction at seeing these groups come together at the banquet and the conference tables.

In the past year I have had the pleasure of participating in a conference at the headquarters of the American Legion in Indianapolis and in a conference with these two groups at the headquarters of the American Medical Association in Chicago.

One purpose of the American Legion is the care of disabled comrades to which I subscribe wholeheartedly. I had that purpose in mind when I suggested a plan of service to disabled veterans.

To make logical and effective plans for the medical care of any group of people, it is necessary to know something of their number, their age, their sex, their location, their economic status, their occupations and social conditions, as well as to have information as to the peculiar types of conditions (diseases and injuries, if any) likely to arise among them.

About 4,500,000 men and women in the United States are classed as Veterans. All but about 30,000 are men. Their average age is about 40 years. Of these a vast majority are veterans of the World War. The next largest number are veterans of the Spanish American War, and the third largest group, veterans of the Civil War.

Based on the most reliable information obtainable as to distribution, it can be said that these veterans are located in every state, every city, every township and every rural district in the United States. Their distribution is not materially different from that of the population of the country as a whole.

Veterans occupy every round of the economic ladder. From the beggar on the streets to the prince of wealth. In so far as I can learn, the number found in each of the various economic groups corresponds proportionately to that of the population of the country as a whole.

They are engaged in every form of activity known to our country. There are laborers in industry, farmers, both tenant and owner, clerks, executives, professional men, doctors, lawyers, preachers, politicians and statesmen. Veterans are found in every group. It is reasonable to assume that a vast majority of them are married men or women and the heads of families.

With certain exceptions to be mentioned later, the disabilities (diseases and injuries) to which they are subject are the same as those to which other men of a similar age and occupation are subject. Of course the exceptions are certain types of injuries received in the war which are not often met with in civilian life. For example, the nervous condition designated "shell-shock," in the veterans of the World War, and amebic dysentery among veterans of the Spanish American War. Veterans are now civilians. They are engaged in civilian pursuits. They are living the lives of civilians.

The diseases and disabilities which this group of people will suffer as time goes on, are those which will afflict the rest of the population of the country. The most prevalent acute diseases will be acute respiratory conditions such as influenza and pneumonia, acute surgical diseases such as appendicitis and cholecystitis, acute injuries such as result from automobile and industrial accidents, etc. Other diseases will be the heart diseases, kidney diseases, cancer and other degenerative diseases. The acute conditions which ordinarily attack young adults will not occur with great frequency in this group.

Physical Condition. The physical condition of this group, as a whole, is superior to that of a like number of men and women of a similar age, excepting those who suffered war injuries. To substantiate this statement consider that:

First, men who are not physically fit are not taken into the Army or Navy. Over thirty per cen of the men who were registered under the draft act were rejected on account of physical defects.

Second, veterans of the World War constitute a vast majority of the total number of veterans. Of this number only a relatively small proportion saw front line service. About half of the number left the shores of the United States. About 400,000 of them were in the Student Army Training Corps, in colleges and universities of this country during their entire military careers. All of these men received physical training regarded as beneficial. All received instructions and practice in hygiene and sanitation. All received treatment to immunize them against typhoid fever and smallpox. For these reasons, the disability rate of this group of people should

not be as high as that of any other group of similar age, size and distribution in this country.

It is obvious that our task is not that of planning medical and hospital service for an isolated group. Such a group, for example, as soldiers in the fields, or in camps; or a group of industrial workers employed in some one industry. Nor are we planning for people who occupy one particular economic sphere. One's inevitable conclusion is that the medical and hospital needs of veterans will correspond to those of the people of this country as a whole, with the exception of the diseases of women and children.

Plans Already in Effect. At this point it is necessary to make brief reference to some plans already in effect for the care of this group of people.

When the World War ended the Government set about making provisions for the care of those soldiers who had incurred disabilities during their military service. Hospitals were built or acquired. Contracts with civilian hospitals were made. A medical personnel was employed, and an elaborate organization set up for the purpose of giving these men every attention possible. In the fall of 1922 an effort was made to effect a contact with every veteran who had any disability whatever with a view to giving him an examination to determine if his disability had any service connection.

The Congress of the United States began the enactment of legislation in the interest of disabled veterans. As was natural, under our system the legislation was not always well planned. In one instance, a group of veterans would sponsor a piece of legislation that would affect some particular group of veterans. In another instance a Congressman would originate a bit of legislation that would affect another group of veterans, and so on. By the enactment of a large number of separate bills affecting various different groups Federal legislation in the interest of veterans gave something of the appearance of a crazy quilt.

In 1924 all the legislation in the interest of World War veterans was codified into what became known as the "World War Veterans' Act" of 1924.

It will be remembered that up to this time most of the legislation was in the interest of those veterans who suffered disabilities from injuries or disease while in service. These are called service connected disabilities. In this year (1924) legislation in the interest of disabled veterans, who suffered no disability from war service, began. Among the early bills was one which provided that an ex-soldier of the World War who developed tuberculosis at any time prior to 1925 is presumed to have contracted the disease in service or that the disease was aggravated by service, thus making such cases of tuberculosis service-connected by legislation.

Also in 1924 the Congress went a step further and enacted the first part of Paragraph 202-10 of the World War Veterans' Act. The essential provisions of this paragraph are that free hospitalization and traveling expenses to and from the hospitals are provided for veterans suffering from six specified conditions which are not of service origin. These six conditions are: neuropsychiatric conditions, tuberculosis, paralysis agitans, encephalitis lethargica, amebic dysentery and the loss of the sight of both eyes. Veterans with these conditions were eligible to these benefits so long as beds were available.

It will be remembered that in 1924 a large percentage of beds in veterans' hospitals had been vacated by reason of the fact that veterans with service connected disabilities had recovered, died or reached such a state of improvement that hospitalization was no longer needed.

It is obvious from the wording of this paragraph that the sponsors of this legislation thought that veterans suffering from these particular conditions might just as well occupy vacant beds in veterans' hospitals. Especially is this true in view of the fact that facilities for the care of the insane and for the care of the tubercular were crowded. In just a short while this particular paragraph (202-10) was amended and this amended amendment empowered the Director of veterans' affairs to furnish free hospitalization and free transportation to and from the veterans' hospitals to all veterans who need hospitalization *without regard to the nature or origin of their disabilities,* with the additional provision that these benefits are to be allowed so long as beds are available. In such a manner the original provisions of Paragraph 202-10 affecting veterans with six definite chronic conditions was broadened so as to include every form of disease or disability suffered by any veteran without regard to his economic condition and

without any regard whatever to the origin of the disability.

Pursuant to the powers thus created Congress appropriated money for the construction of veterans' hospitals in large numbers and the construction has gone on as rapidly as money has been appropriated. Thus was inaugurated the Federal system of hospital, medical and surgical service for all diseases and injuries of all veterans requiring hospitalization without regard to service or without regard to the nature or origin of disabilities.

If such a program or policy is to be carried to its logical conclusion, and there is no reason to doubt the intention of the Congress and the veterans to carry this policy to its logical conclusion, it simply means the construction of a sufficient number of veterans' hospitals throughout the United States to accommodate all of the hospital needs of all the veterans.

It requires little thought for one to recognize that such a program could not be completed in a short period of time. For this reason the facilities at the present time are wholly inadequate to accommodate the needs of veterans. Therefore, only a small part of veterans can be benefited. It is perfectly obvious also that the time will come soon when the number of beds will exceed the needs of veterans. It is also obvious that such hospitals would be of little use to veterans suffering from acute emergency conditions.

Thinking of this particular situation I was driven more and more to the conclusion that this program on the part of the Federal Government is unnecessary under existing conditions. That it was unsound from the standpoint of public policy; that it was unsatisfactory from the standpoint of the veteran and uneconomical from the standpoint of the Government. So I sought to work out a plan whereby the veteran who is disabled would receive financial aid from the Government which would still enable him to remain in the normal channels created for the care of all sick people—namely, in the care of the physicians and hospitals at or near his home, and at the same time preserve to the veteran the privilege of making his own selections as to his doctor and hospital.

In an attempt to carry out such a policy thought naturally turns to some sort of disability insurance. This is a form of protection which a large per cent of people purchase for themselves. It is a form of protection with which we are all familiar. It has been found satisfactory in meeting the needs of people. Such protection is being sold in increasing volume all the time. Individual policies are sold; group policies affecting large groups are sold. Such a plan was incorporated into Workmen's Compensation Laws throughout this country.

The carrying out of such a plan would involve the Government in no construction at all. All the money spent by the Government, except a small cost of administration, would go direct to the veteran when disabled from any cause not service connected. Every veteran would be equally benefited regardless of whether he lives in some remote section or next door to a veterans' hospital. The benefits would be available to veterans immediately without waiting for the completion of an enormous hospital program.

So I wrote out a brief statement of such a proposal in the form of a resolution and presented it to the House of Delegates of the A. M. A. in Philadelphia, last year. The result of the adoption was an immediate kick-back from veterans all over. I received condemnatory letters from almost everywhere from men who knew nothing of the details of the proposal. I have since received endorsements from many of the same men, who have been more thoroughly advised as to its workings.

THE PLAN

A tentative draft of an amendment to the World War Veterans' Act with these principles embodied in it has been made by me. Its provisions, briefly, are:

1. That the Government issue to every veteran a disability insurance policy, or certificate of disability benefits, with benefit provisions as follows:

(a) The payment of a cash benefit to a veteran during any period of total disability for causes which are not service-connected.

(b) The payment of a hospital benefit in addition to the cash benefit during any period of hospitalization for causes not service-connected.

Please bear in mind that all diseases which are of service origin are not affected by this plan; and under the provisions of the tentative draft the six diseases mentioned in the first part of 202-10 are not affected by this plan by which, too, all other disabilities would be treated.

In the tentative draft it is provided that the cash benefit shall be $12.50 per week and the hospital benefit $4.00 per day, payable to the veteran. These amounts may not be just what they should be but the weekly cash benefit is in line with the amount of weekly benefit paid under Workmen's Compensation Laws in this country, and the hospital benefit of $4.00 per day is in line with the cost of administering general hospitals in this country. These amounts could be adjusted to conditions as they arise in the future without changing the plan or system of administration.

The Administration of the Plan. The Administrator of veterans' affairs in Washington would become the administrator of this law through the Bureaus which are already established throughout the United States.

There is a Veterans' Bureau in every state and a physician appointed in many of the counties of the various states who is known as "designated examiner."

Details of the administrating would correspond to those of a private insurance concern, more or less familiar to all.

A veteran is taken ill or receives an injury. He calls his physician who takes charge of his case. He is removed to a hospital or not, as the case may require. The disability is reported to the Veterans' Bureau. If hospitalized this fact is reported. The Veterans' Bureau can make such examination as it may deem necessary to determine whether or not the claim thus filed is bona fide. If it is found to be bona fide it is paid. If it is found not to be bona fide it is disallowed. By such a check fraud would be prevented if attempted, but in the case of genuine disability the aid comes at the moment when needed and is of a character that is needed. That is all there is to it.

Compare this with the administration of veterans' hospitals. We will assume that the same veteran is ill with the same condition: The veteran calls his physician who advises him that hospitalization is needed. Then the condition must be reported to the Veterans' Bureau. The Veterans' Bureau must make an examination of the veteran to determine if hospitalization is needed. When this examination has been made and hospitalization determined upon then the Veterans' Bureau must locate a vacant bed in a veterans' hospital, and then make arrangements for the transportation of the veteran to that particular bed. Now contemplate the delay and the complications incident to the administration of this particular form of benefit to a veteran who resides at some distance from a veterans' hospital, and who is suffering from some emergency condition.

I might cite you at this point a few examples. I will cite one to illustrate the point.

A veteran who lives some sixty miles from Nashville was taken ill in the afternoon with pain in the abdomen. He went home and took a purgative, paregoric and various other home remedies. The following morning he called in his doctor. The doctor diagnosed the condition acute appendicitis. He put him in his car and brought him to my office with a view to my operating on the man. The man knew he had the right to go to Memphis to the Veterans' Hospital and demanded that he be sent to Memphis. It is 240 miles away, so I contacted the Veterans' Bureau and told them the circumstances and asked that the man be examined. A doctor was sent and the diagnosis was confirmed. That was about noon following the day of onset. The next train to Memphis ran at 11 p. m. He was held over. An attendant was put with him. He was sent to Memphis and arrived the following morning and was operated on that day. Instead of him being a twenty hour appendix he was a forty-eight hour appendix when operated on. The last I knew of the case he had been in the hospital some three months. It is possible that he had drainage with a weakened abdominal wall and may be in line for some form for permanent disability.

So much for the administration of the two plans.

But other questions naturally arise. One of the first is this—Are there adequate facilities in the United States for the care of these veterans and the civilian population. This may be disputed but I assert on what I think is good authority that the facilities are adequate.

Consider for a moment what constitutes good medical attention. *Good medical attention consists primarily of the attention of a good doctor whose efforts are supplemented by facilities such as laboratories, hospital equipment, instruments, nursing, etc., as the case may require.*

The institutional factor has been over-emphasized in the last few years in connection with the

care of sick people. Capable authorities have often urged that the attendance of a good doctor with the nursing care that is available in the average home in the United States constitutes all the care that is necessary for a majority of illnesses that occur. I don't think this statement would be disputed by anyone who has had experience with the care of sick people.

The need of hospital facilities and laboratory facilities for those who need this type of attention goes without saying. It needs no emphasis.

To hospitalize a patient who does not need it is of no advantage to the patient and adds enormously to the cost of his care. On the other hand to fail to hospitalize a patient whose condition does need it and to fail to attend to it promptly is to fall short of the proper care and subjects the patient to hazard of both life and function.

Are capable doctors and hospitals available in the United States? First, as to doctors. There are over 140,000 doctors, of whom over 91,000 are members of the American Medical Association. The number certainly is adequate. As to their ability a few statements will suffice. About 30,000 of them fourteen years ago were found qualified for the service of the Army and Navy. About 9,336 are qualified for membership in the American College of Surgeons. A similar number are in the American College of Physicians. Large numbers are members of various other special groups which require superior qualifications for membership.

A large portion of the membership of this Association is familiar with the steps that have been taken in the last twenty-five years to improve the qualification of doctors. You are familiar with the results that have been obtained. I believe that you will all agree with the statement that the medical services rendered by doctors throughout the United States is equal if not superior to that rendered in any country on earth.

There is no need of my discussing at any length the training that graduates of medicine have had since the World War. These doctors are distributed proportionate to the population as a whole. They are so located as to be available and in easy reach of most any point.

Second: Hospital facilities. You are familiar with the tremendous progress that has been made in recent years with reference to hospitals. Their number has increased enormously. The quality of their service has increased correspondingly. As of 1931 there were 6,767 hospitals in the United States.

The College of Surgeons some years ago began the work of standardizing hospitals. Not all hospitals have requested a classification by the College, but a sufficient number have been examined and approved to give us a definite idea of the hospital facilities of this country as a whole.

There are 2,158 hospitals on the approved list of the College for the year 1931, with a total bed capacity of 324,216. Of these beds 23 per cent are unoccupied. Their distribution proportional to the population; large ones in large centers; small ones in small centers, etc. Of this number 64 are Veterans' hospitals. The other government hospitals are Army and Navy and Public Health Service.

Display of the Map. It is necessary to give emphasis to the distribution of hospitals because their distribution has a definite bearing on their availability for services for routine injuries and illnesses requiring hospital care. Chronic conditions such as insanity, tuberculosis, etc., may be hospitalized a long distance from home. Delay of admission for a short time is no serious matter. Delay in the case of acute appendicitis may mean the complication of peritonitis, or abscess formation. It may mean death or prolonged drainage and some degree of permanent disability. So hospital facilities not only must be adequate—they must be so located as to be available without delay and long travel.

The economics of the plan. Someone may suggest, as has often been suggested, that there is no provision in the plan I proposed for doctors' fees. My answer is that it was purposely left out. It is the common practice of doctors to do worthy charity without cost. Their charges, when made, are proportioned to the ability of the patient to pay. Doctors then will look to the private resources of the veteran for their remuneration. Those able to pay will pay. Those not able to pay will not pay.

Hospitals. The hospitals of this country are eleemosynary institutions. Their charges for service vary from nothing to several dollars per day in the same institution where the same laboratory, the same x-ray equipment, the same technicians, the same personnel and practically

the same service is given to charity, part-pay and full pay patients. A large number of hospitals are operated by the Catholic Church. Others by Protestant denominations such as Methodist, Episcopal, Baptist, Presbyterian and others by Jewish people. Some are supported by fraternal orders. Others are partly supported by the county and municipalities. They are not run as profit making institutions. Their purpose is the care of the sick people in the community in which they exist.

The hospitals are not perfect. No one could say that the government is perfect, or that humans are perfect. I do believe that there is ample evidence to support the assertion that the United States is better supplied with excellent hospitals than any other country on earth.

I would insist, therefore, that the facilities for the proper care of veterans, both as to doctors and hospitals, exist already in the United States. Under the plan proposed the veteran seeks and obtains the services of the doctor of his preference in his community. If hospitalization is required he would seek and obtain admission to the hospital of his choice. If he is a Catholic he prefers a Catholic hospital—he is more contented there. If he is a Protestant the same rule might apply. He obtains hospitalization in close proximity to his home where he can be visited by his family which will promote his contentment.

The money paid by the government to the veteran in the way of hospital benefits would go to the treasuries of the hospitals. It would be expended by them, not in dividends to stockholders, but in improving the equipment and service of the hospitals. Thereby the hospital service of the country for the veteran and non-veteran alike would be improved.

This plan steps in as an aid to the veteran who is disabled but does not need hospitalization at all. The veterans who can receive adequate treatment at home had better be left at home.

It may be alleged that the veteran may make a poor selection of a doctor, or that he may be tempted to become a malingerer and draw payments to which he is not entitled. It is perfectly reasonable to assume that a relatively small number of veterans might select the doctors least capable of rendering service. In that event the *designated examiner* for the Veterans' Bureau in the same community would make an examination of the veteran. If the veteran is malingering it would be discovered and his claim disallowed. If an error in diagnosis has been made, an opportunity for correction is thereby afforded. A consultation has been brought about between the good doctor and the poor one in the interest of the veteran. The operation of this plan would, therefore, tend to improve the medical attention veterans are receiving at home throughout the country today.

Cost. The cost of the operation of this plan must be within reason. It is determined by three factors, viz: 1. The disability rate. 2. The amount of cash benefit, and 3. the amount of the hospital benefit.

An enormous experience has grown up in this country on which to base an estimate of disability expectancy. One week per year per person among industrial workers, both men and women, both colored and white, is the usual disability experience.

Veterans should not give a disability rate so high, as their age is a favorable factor; their physical training is a favorable factor and their sex is a favorable factor. Men experience a lower disability rate than women and there are relatively few women in this group. Further, the chronic diseases of service origin are eliminated from this plan, in addition to the six conditions named, insanity, tuberculosis, encephalitis, etc.

For all these reasons, and others which might be mentioned, these veterans should experience a disability rate much lower than one week per year per person. For the purpose of computing costs, this rate of disability will be used.

In the tentative act drawn, a ninety day service clause was inserted which eliminates those veterans who served less than ninety days. It reduces the number of veterans to about 4,000,000. These 4,000,000 veterans will experience 4,000,000 weeks of disability the first year. The cash benefit will amount to exactly $50,000,000. The disability rate will diminish each year. The cost will diminish each year in proportion. In 20 years the cost would be negligible. Of the 4,000,000 weeks of disability about 10% will require hospital care. This is a liberal estimate for the following reasons:

First, as before stated a majority of cases of acute illness do not require hospital care.

Second, illnesses which do require hospital care do not require it for the entire period of their disability. For example, a case of acute

appendicitis is operated on early and discharged from the hospital in one week to convalesce at home. His period of disability may exist for six weeks, depending on the nature of his work. The same is true of acute injuries, gall-bladder disease, gastric ulcer, etc. So this is not an estimate given to make the costs appear small. It is a liberal estimate, logically arrived at.

Ten per cent of the weeks of disability is 400,000 weeks requiring hospitalization. At the rate of $28.00 per week the hospital benefit amounts to $11,200,000.

Cost of administration should not be in excess of 5% of the total benefits, in line with the costs of administering benefits by insurance companies. This item at this rate amounts to about $3,060,000 for the first year, making a total cost of $64,260,000 the first year.

As time passes the number of veterans will diminish, and the costs will decrease until the last veteran has passed away. Then the plan ceases to be. There are no buildings and equipment to be abandoned, no large personnel to be disbanded. Civilian medical and hospital service will progress along the usual lines undisturbed by the effects of a dual system of rendering service—one operated by the Government, the other by private enterprise.

This plan is in line with well established precedent as to governmental policies which is that of encouraging private enterprise. The government is now lending its credit and money to encourage private industry. The government does not go into manufacturing because that line of business has faults. It does not build railroads or engage in commerce. It rather pursues the policy of aiding these enterprises and acting as umpire to the end that they be conducted efficiently and in the best interest of the public. Such a policy encourages, it does not stifle individual initiative.

In this insurance plan of benefits to veterans the government acts in the capacity of umpire. It passes on the question as to whether claims are just and as to whether the proper institutional services are rendered.

There is the widest possible difference between the policy under which the government administers benefits in the form of cash which enables the veteran to obtain medical and hospital services as the case may require in the channels already created for the purpose, and the policy which puts the government in the business of creating the facilities, employing the personnel and rendering the actual services to veterans. The latter is state medicine complete and absolute insofar as 4,000,000 people are concerned. The other is a form of financial aid exactly when needed, to those to whom the government has assumed a definite obligation.

THE COST OF GOVERNMENT HOSPITAL PLAN

The cost of constructing, equipping, staffing and maintaining a sufficient number of government hospitals to accommodate all the hospital needs of all veterans, to say nothing of the cost of transporting veterans to and from the hospitals, is difficult of estimation. The most conservative estimates possible run into figures that are perfectly enormous. For example, the cost of construction per bed is $3,500.00. The cost of maintaining general hospitals is $4.42 per day per bed. The cost of the professional staff is $151.00 per year per bed. The cost of admitting the patient—that is the transporting of veterans—is approximately $30.00 per admission. The cost of equipment would be enormous.

A member of the medical council of the Veterans' Bureau estimated that 129,859 hospital beds would be required to meet the needs of all these veterans. This is merely an estimate, in my opinion a very conservative estimate, but no one knows. Based on this estimate the cost of constructing the additional beds would be in round numbers $300,000,000. The cost of the professional staff would be approximately $20,000,000 per year. The cost of maintenance would be approximately $200,000,000 per year, and mind you, it would be necessary to enlarge the Veterans' Bureau to maintain such a system of hospitals because the Bureau would have to do with the examination of veterans to determine the need of hospitalization and with arranging their transportation, etc.

In a few years a large number of veterans now living will be dead. The number of hospital beds would be in excess of the number needed, and so on. This excess of beds would increase until the last veteran is gone and no bed would be needed at all. What would happen then? Would anybody be so rash as to dream that such an organization and such buildings and equipment, and such a large group of people would ever be abandoned.

In this connection it might not be amiss to remind you of what is happening in Congress today.

Everybody has agreed that there are many bureaus and departments which are expensive and not at all necessary, yet those departments have developed a sufficient political power to resist their political destruction in spite of the added force of the worst economic depression that has ever come upon us.

I can see no ground for hoping that such a program would ever be abandoned but to the contrary I see good ground for believing that such a program would be enlarged until it has engulfed medicine in America.

Anatole France said, "The future is hidden from us all, even from those who make it." However true this may be, I cannot help but entertain a fear as to what the future of medicine in America may be if the Federal Government constructs and maintains hospitals of all types in sufficient number and so distributed as to meet all the needs of all veterans.

Doctors Building.

URINARY ANTISEPSIS—INTRODUCTION OF A NEW PRODUCT FOR ORAL USE†

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The search for an efficient urinary antiseptic continues feverishly. A review of the literature of the last decade reveals a shifting of the medical profession from one type of therapy to another. It is interesting to note the cyclic enthusiasm and popularity which follows introduction of a new type of chemical compound or a new mode of administration.

Failure of new oral drugs swings the pendulum toward intravenous therapy. Failures with the latter have led to new studies of vaccines, both stock and autogenous, and more recently of bacteriophages.

All these various methods have had successes and failures, which well they must, because the "ideal" urinary antiseptic, that will work in every case, has not, and I believe never will be found.[1] Every case of urinary infection is a problem in itself and requires painstaking study with all the resources at the command of the urologist.

The importance of routine, thorough urological study will become apparent at once when one considers all the possible lesions that may be contributing factors in urinary infection.[2] Such factors as urinary stasis, calculus, new growth, tuberculosis and trauma represent a few of the various conditions which must be investigated and corrected, when possible, before any antiseptic can prove effective.

Careful clinical study of the patient will in many cases suggest the source of the infection.[3, 4] Tuberculosis, bowel disturbances, infected teeth, tonsils and other focal infections are often contributing factors.

Bacteriological and chemical study have recently been emphasized more and more. The

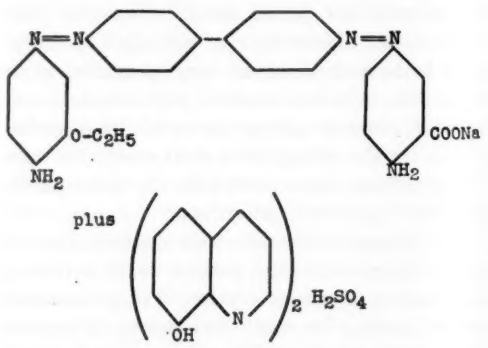

Fig. 1. *Chemical Formula*
Diphenyl-disazo-ethoxyaminophenol-aminobenzoic Sodium plus Hydroxyquinoline sulfate.

causative organism must be known. Even yeast and parasites are offenders.[5, 6] The chemical characteristics of the urine as a culture medium must be studied repeatedly because of the behavior of the bacteria under varying circumstances.

The development of so-called drug-fast characteristics in bacteria and the consequent necessity for drug rotation has been repeatedly emphasized.[7] The regulation of acid-base equilibrium by diet, mineral waters and chemicals, both acidifiers and alkalizers, has received a great deal of investigation in recent years, especially by German investigators.[8]

Modes of Combat.—Intravenous chemotherapy has received a long and varied trial. Hexame-

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†Read before the Chicago Urological Society, May 25, 1932.

thylenamine and its derivatives, also acriflavine, mercurochrome, neo-salvarsan, and many other drugs have been used by this route.[9] The limitations of hexamethylenamine are now well understood. Neo-salvarsan obtains miraculous results in some cases, especially those in which Gram-positive organisms are the cause, but fails utterly in the majority. The other substances, especially mercurochrome, produce excellent results in some cases, but because of the severe systemic reactions which often follow, their use has been largely limited to desperate individuals.

Oral Medication.—The use of dye compounds as anti-bacterial agents starts with Ehrlich and gained new impetus during the world war with methylviolet, brilliant green, naphthalin derivatives and acridin compounds.

After the war came derivatives of fluorescein, such as mercurochrome and recently a large variety of azo compounds has been developed.

All the dyes mentioned are of varying antiseptic value and have limitations, particularly when administered orally. Gentian violet, mercurochrome and acriflavine produce gastro-intestinal upsets of such degree as to preclude their general application.[4] The staining of utensils and the patients' clothing is objectionable. It is exactly this staining power, however, on which most of them depend for their therapeutic activity that makes them least agreeable to the patient, aside from their high cost.

Objective.—This investigation was undertaken primarily from the standpoint of the urogolist, that is, to develop a product for oral administration in genito-urinary infections, particularly gonorrhea. The development of the compound was the result of two years extensive research along the lines of azo compounds, by Joseph Ebert, Ph. D., of Philadelphia, to whom I am indebted.

The goal which we set for our new azo compound was that of Davis,[1] namely, a chemically stable compound, comparatively non-toxic and non-irritating to the urinary tract, eliminated unchanged by the kidney, and exerting a definite antiseptic action in high dilution in urine of any reaction. In addition we proposed, if possible, to eliminate staining and keep the cost of the product within easy reach of the wage earner.

Furthermore, we had in mind the possibility that a dye might be found of bactericidal and bacteriostatic value which, in itself, being colloidal could be combined with another chemical compound of antiseptic value with the result that the antiseptic properties of the final product would be materially higher than of either agent singly.

Chart 1

Bacteriological Tests on
Diphenyl-disazo-ethoxyaminophenol-aminobenzoic sodium.

Organism: Staphylococcus pyogenes aureus. (Reddish Method).

Bacteriocidal

Dilution	5 min.	10 min.	15 min
1-100	—	—	—
1-500	—	—	—
1-1000	—	—	—
1-1500	+	—	—
1-2000	+	+	—

Bacteriostatic

Dilution	1-500	1-1000	1-1500	1-2000	1-3000
	—	—	—	—	+

Bacteriological Tests on
o-Hydroxyquinoline Sulphate

Organism: Staphylococcus pyogenes aureus. (Reddish Method).

Bactericidal

Dilution	5 min.	10 min.	15 min
1-100	—	—	—
1-500	+	+	+
1 1000	+	+	+
1-1500	+	+	+
1-2000	+	+	+

Bacteriostatic

Dilution	1-500	1-1000	1-2000	1-5000	1-10,000	1-20,000
	—	—	—	—	—	+

The azo compound number 104 in our series seemed to meet these requirements. It is the Sodium salt of Diphenyl-disazo-ethoxyaminophenol-aminobenzoic acid. This substance was tested in vitro against staphylococcus aureus and showed a completed bactericidal effect in ten minutes in a dilution of 1:2000 and equal bacteriostatic strength. (Chart 1.) It is practically insoluble in water. It is of yellowish-brown color and shows a remarkable colloidal behavior. On mixing it with o-Hydroxyquinoline sulphate (or other o-Hydroxyquinoline salts) the rather astonishing observation was made that the bacteriostatic value of the mixture increased one hundred times tested against the same organism, although the bactericidal strength remained the

same. (Chart 2.) The structural formula follows:

Structural Chemical Formula

Chart 2

Bactericidal Tests on

Diphenyl-disazo-ethoxyaminophenol-aminobenzoic Sodium plus Hydroxyquinoline sulfate.

Organism: Staphylococcus pyogenes aureus. (Reddish Method.)

Dilution	5 min.	10 min.	15 min
1-100	—	—	—
1-800	—	—	—
1-500	—	—	—
1-1000	—	—	—
1-1500	—	—	—
1-2000	+	—	—
1-3000	+	+	+
1-5000	+	+	+
1-6000	+	+	+

Bacteriostatic Tests on

Diphenyl-disazo-ethoxyaminophenol-aminobenzoic Sodium plus Hydroxyquinoline Sulfate.

Organism: Staphylococcus pyogenes aureus.

Dilution	1-1000	1-2000	1-4000	1-8000	1-10,000	1-15,000
	—	—	—	—	—	—

Dilution	1-20,000	1-30,000	1-50,000	1-60,000	1-75,000	1-100,000
	—	—	—	—	—	—

Dilution	1-150,000	1-200,000	1-300,000	1-400,000	1-500,000
	—	—	+	+	+

This point, as well as further bacteriological and pathological tests,* seemed to indicate to us that it is entirely possible to use this dye as a colloidal carrier of a more powerful antiseptic for oral administration.

I suggest the shorter name Ambazin for this combined compound because it suggests its azo character with two amino groups.

The minimum lethal dose was established as 800 mgm. per kilo body weight determined by the intramuscular injection of the aqueous suspension in rats.

Elimination.—The dye mixture is excreted in the urine of normal color but can be detected in the urine or feces by chemical tests. Addition of strong hydrochloric acid produces the hydrochloride of the dye which is a more or less deep wine-red color, depending upon the amount of dye present. The oxyquinoline may be detected by making the urine alkaline with sodium hydroxide, the free base forming a voluminous precipitate. We have no data on elimination through the skin nor have we noted its appearance on the breath. The dye is converted in the stomach into its hydrochloride, the extent depending on the acidity of the gastric juice. The oxyquinoline sulphate passes through the stomach unchanged. The hydrochloride of the dye is reconverted in the intestinal tract into its sodium salt while the oxyquinoline sulphate is changed to its free base, both reactions depending on the degree of alkalinity of the intestinal juice. Each capsule contains 0.2 grams of substance, the dye and oxyquinoline sulphate being in equal proportions.

The average duration of elimination is 48 hours. From eighty-four to ninety-two per cent. of the compound ingested is eliminated in the urine and eight to ten per cent. in the feces. This latter fact may prove to be of interest in the treatment of intestinal infections, especially when associated with chronic colon bacillus urinary disease. Other uses have not been investigated although it is believed the compound should prove of value in certain other diseases of infectious character.

It has been shown that some of the drugs used for urinary antisepsis are excreted in the urine in limited percentages, a large amount being eliminated through the bowel. The reason for their beneficial effect is ascribed to the antisepsis produced in the gastro-intestinal tract,[4] or a secondary toxic effect on the bacteria similar to a protein injection.[10]

The high bacteriostatic value seemed of particular significance to us as it could be safely assumed that the oral administration of the therapeutic dose of the compound would set up a bacteriostatic field in the entire urinary tract. This is often accompanied by increased blood leucocytosis and presumably phagocytosis.

Extensive clinical work during the past ten months has substantiated our chemical and bacteriological findings.

Preliminary Clinical Report

The initial and most extensive work, so far, has been carried out on gonorrheal and nonspecific urethritis and their complications. The following subdivisions present a composite study of all our cases. These cases represent a clinical study both in private practice and hospital clinics.

Subdivision A.—A group of thirty cases of acute anterior and posterior gonorrhea received

*This study was conducted by Dr. Malcolm J. Harkins, Bacteriologist of The Research Institute of Cutaneous Medicine, Philadelphia.

Ambazin capsules singly and conjunctively with urethral injections of various solutions of silver salts. In this group the average duration of treatment to end of observation totaled 7.5 weeks. A study of the time element in relation to disappearance of discharge and freedom from organisms showed an average period of 4.2 weeks. Final check-up included negative prostatic smears, passage of a sound, indulgence in alcoholic drinks and intercourse with a condom.

In this clinical subdivision six cases responded to treatment with capsules alone and were maintained on that technique. Twenty-four cases were treated with the combined measures of capsules and injections of silver solutions.

Although the outcome in both groups was about the same, averaging 7.7 and 7.5 weeks, respectively, it was not our intention to disprove the need for combined therapy. We were endeavoring to determine the effect of Ambazin and incidentally see if either method would be more likely attended by complications.

One case developed a mild epididymitis which subsided within four days. One case of epididymitis was presented for treatment that subsided after one weeks' medication with capsules only and then continued to an uneventful conclusion on the combined technique. One developed an acute posterior urethritis while under treatment. No secondary reactions, such as prostatic abscess, prostatitis or gonorrheal arthritis were observed in this group.

A large variation of silver solutions was used without any noticeable difference.

Subdivision B.—Twelve dispensary cases, while not returning for final check-up to satisfy our clinical determination of cure, were free from discharge and organisms. The rapid disappearance of symptoms was again noteworthy. This absence of discharge probably satisfied most of these patients that they were cured. The average duration of treatment of the twelve cases were 3.4 weeks to freedom of symptoms and organisms and 5.5 weeks to end of observation. No complications were observed.

Subdivision C.—The failure of twenty cases to attend the clinic regularly for four consecutive weeks made their records valueless for comparative purposes.

Subdivision D.—Recognizing the possible advantages of the compound when given as urethral injection and irrigation, a series of ten cases was tried on a routine which included either one or both of these measures together with oral medication. An aqueous suspension of 0.5% strength was used but clinical results were not encouraging due, we believe, to the possibility of too high a concentration. Frequently the patients were organism free in the period averaged by the other groups, but they developed a typical chemical urethritis that often persisted until controlled by astringent measures. The average course of treatment was 14.5 weeks. For this reason the use of Ambazin in suspension form was abandoned until further research on this phase of application can be undertaken.

Subdivision E.—A series of seven miscellaneous cases that responded favorably included the following: Two cases of non-specific urethritis responded in four and six weeks, respectively. One case of chronic gonorrheal prostatitis responded following seven weeks treatment and another similar case following nine and one-half weeks treatment. One case of chronic anterior and posterior gonorrhea in nine weeks and one case of gonorrhea with a mixed infection in seven weeks.

Two cases of non-specific prostatitis in this group failed to respond.

The usual measures, such as prostatic massage and deep instillations, were employed without any supplementary medication other than Ambazin.

Subdivision F.—A series of twelve cases of acute anterior and posterior gonorrhea failed to respond. Only five of these cases were on our so-called standard treatment. The balance received the Ambazin suspension (injection and irrigation) and the results were influential in our decision to drop its use.

Technique.—The standard treatment routine consisted in giving one Ambazin capsule, three times daily, with a limitation of the fluid intake to 1500 cc. in twenty-four hours, to provide a concentration within the maximum therapeutic range of the drug. A bland diet was recommended, with complete abstinence from alcoholic drinks or sexual excitement.

If the case was hyperacute, or complicated, we withheld injections of all kinds until the symptoms subsided and the second portion of the two glass urine test became clear. Ambazin alone

would accomplish this in the majority. A few severe cases were given sodium bicarbonate, bromides or hyoscyamus.

The local treatment consisted of instillations two to three times daily. The solutions used were argyrol, protargol, neo-silvol and silvogon, without appreciable difference in results.

Cure was determined by repeated microscopical study of the urethral discharge and, after it stopped, of the expressed secretion from the prostate and seminal vesicles.

Passage of a sound, indulgence in alcoholic drinks and intercourse with a condom were additional tests carried out as a recheck in the majority of our cases.

Pyelitis.—A small series of upper urinary tract infections have been treated. The results, while not conclusive, have been striking. The following case histories are representative.

The study of a larger series has been undertaken and will be reviewed in a subsequent communication.

Case 1241459.—Male, aged 60; diagnosis—cystitis. Patient had been sick for one week, suffering with frequent, painful urination. No improvement with urinary antiseptics prescribed previously; brought him to Cook County Hospital for relief. Temperature 99; pulse 90; respiration 20. Urine contained pus cells +++ and albumin +. -A urine culture revealed staphylococcus albus. One capsule of Ambazin was given three times a day and no other medication. The fluid intake was limited to 1500 cc. in twenty-four hours to provide a concentration within the optimum therapeutic range of the drug. His symptoms began to subside on the third day and were gone at the beginning of the second week. The urine at this time showed pus + but culture was sterile. Urine was normal at the third week and patient had not had a recurrence since.

Case.—Female, aged 37; diagnosis—pyelitis of pregnancy. Patient was seen in private practice, complaining of extremely frequent and painful urination. The temperature was 102°. The urine showed pus ++++ and a pure culture of Bacillus coli. She was given one capsule of Ambazin, three times daily. Her recovery and relief of symptoms was rapid. On the fifth day the temperature was normal, urine negative and symptoms completely absent. She has since delivered without recurrence of symptoms.

Case 1240409.—Female, aged 32; diagnosis—pyelocystitis. She had been under treatment for three weeks before entering the Cook County Hospital, taking "kidney medicine," the character of which was unknown. During her stay in the hospital her temperature ranged from 101° to 104° in spite of routine medication. She was given heavy doses of alkalies the first five days without improvement in symptoms or reduction of fever. Sodium acid phosphate and urotropin were then given, fifteen grains, three times daily, following which she made apparent improvement, only to relapse. Ambazin, one capsule three times daily, was started and the improvement that followed was immediate. The temperature dropped quickly and within five days was normal. Urethral catheterization on the seventh day withdrew urine sterile on cultures. The patient has been under observation for two months and no recurrence has taken place.

Resumé.—A total of 100 cases were studied. Ninety-seven were lower urinary tract infections. Of this group fourteen failed to respond. However, seven of these cases that failed received injections or irrigations of the drug in suspension. Twenty were eliminated for failure to attend for four consecutive weeks. Forty-eight were clinically cured and fifteen free from symptoms and organisms at time of failure to report for final check-up. Cases on standard treatment averaged 7.5 weeks to end of observation and 4.2 weeks to freedom from organisms and disappearance of discharge. Three cases of upper urinary tract infection responded favorably.

CONCLUSIONS

1. A new urinary antiseptic, Ambazin, has been subjected to a preliminary series of clinical studies which substantiate the favorable laboratory findings.

2. Although not a specific it is a reinforcing agent of value in the treatment of gonorrhea.

3. A forward step has been made in the therapeutic use of the dye by:

(a) Eliminating the undesirable staining qualities.

(b) Offering a high bactericidal and bacteriostatic action.

(c) An absence of toxicity and irritating action on the urinary tract.

(d) Well tolerated by the gastro-intestinal tract.

(e) An unusually low incidence of secondary complications.

(f) A tendency to shorten the course of treatment.

4. Its use in upper urinary infections has already given satisfactory results and its further study in genito-urinary conditions is warranted.

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(A)—CHEMISTRY

Chemically this compound is the Sodium salt of Diphenyl-disazo-ethoxyaminophenol-aminobenzoic acid plus Hydroxyquinoline sulphate. It is one of a series of 104 compounds that were synthetized and investigated bacteriologically and pharmacologically.

B—BACTERIOLOGY

I—Bactericidal:

1—Staphylococcus pyogenes aureus
(Reddish Method)

TABLE A

Dilution	5 min.	10 min.	15 min
1-100	—	—	—
1-300	—	—	—
1-500	—	—	—
1-1000	—	—	—
1-1500	—	—	—
1-2000	+	—	—
1-3000	+	+	+
1-5000	+	+	+
1-6000	+	+	+

2—Bacillus Coli (Reddish Method)

TABLE B

Dilution	5 min.	10 min.	15 min
1-100	—	—	—
1-500	—	—	—
1-1000	—	—	—
1-1500	—	—	—
1-2000	+	—	—

Interpretation: Ambazin is bactericidal to Staphylococcus pyogenes aureus and to Bacillus Coli in 10 and 15 minutes in a dilution of 1:2000 (Reddish Test).

II—Bacteriostatic:

1—Staphylococcus pyogenes aureus

TABLE C

Dilution	1-1000	1-2000	1-4000	1-8000	1-10,000	1-15,000
	—	—	—	—	—	—
Dilution	1-20,000	1-30,000	1-50,000	1-60,000	1-75,000	1-100,000
	—	—	—	—	—	—
Dilution	1-150,000	1-200,000	1-300,000	1-400,000	1-500,000	
	—	—	+	+	+	

2—Bacillus Coli

TABLE D

Dilution	1-1000	1-2000	1-3000	1-5000	1-10,000	1-15,000
	—	—	—	—	—	+
Dilution	1-20,000		1-30,000		1-40,000	
	+		+		+	

Interpretation: Ambazin prevents the growth of Staphylococcus pyogenes aureus in a dilution of 1:200,000 and of the Bacillus Coli in a dilution of 1:10,000.

III—Bacteriostatic tests carried out in the presence of nutrient broth alone and in mixture with 20 per cent. normal horse serum and 20 per cent. filtered human urine.

Procedure: A stock solution of 1:100 of the compound was prepared. This solution was diluted with sterile distilled water and further diluted with the nutrient broth to the final dilution. Tests were carried out with the broth alone and the broth containing either 20 per cent. normal horse serum or 20 per cent. filtered human urine. The following organisms were added to separate lots of the broth or the broth mixtures and used as the test micro-organisms; staphylococcus aureus, streptococcus viridans, pneumococcus, B. Coli, and B. Diphtheroid. One cc. of a 24 hour broth culture of the above micro-organisms was added to each 100 cc. of the nutrient broth or nutrient broth plus horse serum or urine mixture.

All tests were conducted in test tubes and the compound so diluted that when 1 cc. was placed in each tube and 9 cc. of the broth suspension of the micro-organism added, the final dilution was the desired one, as recorded in the tests outlined below. All tests were incubated for five days at 37.5° C. and the three highest dilutions showing no growth subcultured. The subcultures were incubated for 48 hours and the results recorded.

Micro-organism—Staphylococcus pyogenes aureus

TABLE E

	1-50,000	1-100,000	1-125,000	1-150,000	1-200,000	1-250,000
Nutrient broth, pH 6.8	—	—	—	—	+	+
Nutrient broth plus 20% normal horse serum, pH 6.8	—	—	—	—	+	+
Nutrient broth plus 20% normal urine, pH 6.6	—	—	—	—	+	+

— indicates no growth. + indicates growth.

Micro-organism—Streptococcus viridans

TABLE F

	1-50,000	1-100,000	1-125,000	1-150,000	1-200,000	1-250,000
Nutrient broth, pH 6.8	—	—	—	—	+	+
Nutrient broth plus 20% normal horse serum, pH 6.8	—	—	—	—	+	+
Nutrient broth plus 20% normal urine, pH 6.6	—	—	—	—	+	+

Micro-organism—Pneumococcus

TABLE G

	1-50,000	1-100,000	1-125,000	1-150,000	1-200,000	1-250,000
Nutrient broth, pH 6.8	—	—	—	—	+	+
Nutrient broth plus 20% normal horse serum, pH 6.8..	—	—	—	—	+	+
Nutrient broth plus 20% normal urine, pH 6.6	—	—	—	—	+	+

Micro-organism—Bacillus Coli

TABLE H

	1-1000	1-3000	1-5000	1-8000	1-10,000	1-12,000	1-15,000
Nutrient broth, pH 6.8....	—	—	—	—	+	+	+
Nutrient broth plus 20% normal horse serum, pH 6.8.	—	—	—	—	+	+	+
Nutrient broth plus 20% normal urine, pH 6.6	—	—	—	—	+	+	+

Micro-organism—B. Diphtheroid

TABLE I

	1-1000	1-3000	1-5000	1-8000	1-10,000	1-12,000	1-15,000
Nutrient broth, pH 6.8.....	—	—	—	—	—	+	+
Nutrient broth plus 20% normal horse serum, pH 6.8.	—	—	—	—	—	+	+
Nutrient broth plus 20% normal urine, pH 6.6	—	—	—	—	—	+	+

Interpretation: In nutrient broth alone (pH 6.8) and in nutrient broth plus 20 per cent. normal horse serum (pH 6.8) and in nutrient broth plus 20 per cent. normal urine (pH 6.6) Ambazin was found bacteriostatic to—

Staph. pyog. aureus in dilution of 1:150,000.
Streptococcus viridans dilution of 1:150,000.
Pneumococcus in a dilution of 1:150,000.
Bacillus Coli in a dilution of 1:8,000.
Bacillus Diphtheroid in a dilution of 1:10,000.

IV—Bacteriology of urine after medication with Ambazin. This compound was given to a normal not infected person in a dosage of 0.2 grams three times a day. After 48 hours (or six doses) the urine was found sterile. Administration of the same dosage was continued for 5 days (16 doses). The urine showed the following bacteriological picture.

TABLE K

Staphylococcus aureus.....	5 min.	10 min.	15 min.
Urine 5 days not diluted..	no growth	no growth	no growth
1-5	growth	growth	growth
1-10	growth	growth	growth

TABLE L

Bacillus Coli	5 min.	10 min.	15 min.
Urine 5 days not diluted..	growth	growth	growth
1-5	growth	growth	growth
1-10	growth	growth	growth

Medication was continued for another 24 hours or until 20 doses each 0.2 grams had been given. The bacteriostatic findings are recorded in the following table:

TABLE M

Urine 6 days	Not diluted	1-1	1-2	1-5	1-10	Culture Control
Staphylococcus aureus	—	—	—	—	—	+
Bacillus Coli.....	—	—	—	—	—	+

—indicates no growth; + indicates growth.

Incubated 5 days at 37.5° C. Normal urine not diluted from an individual who had not received the compound showed growth.

Interpretation: Administration of Ambazin to a a normal not infected person in three daily doses of 0.2 grams each causes the urine to be sterile after 48 hours (6 doses). Administration for 5 days (16 doses) made the urine bactericidal to staphylococcus pyogenes aureus but not to Bacillus Coli.

Administration for 6 days (20 doses) made the urine bacteriostatic to staphylococcus pyogenes aureus and B. Coli in dilutions up to 1:10.

normal not infected person in three daily doses of

In these tests the pH value of the urine ranged from 5.2 to 4.8 (normal urine approximately 6.0).

PHARMACOLOGY

The following table represents the toxicity tests on rats (intramuscular injection of the aqueous suspension of Ambazin. "X").

TABLE N

Rat No.	Weight grams	Sex	Dose per kilo.	Amt. injected	Results 1 day	2 day	3 day	4 day	
1	220	M	0.4 grams	1.76 c.c.	—	—	—	—	Normal 21 days
2	175	M	0.5	1.75 c.c.	—	—	—	—	Normal 21 days
3	200	M	0.6	2.40 c.c.	—	—	—	—	Normal 21 days
4	130	M	0.8	1.04	—	—	—	—	Normal 21 days
5	200	M	1.0	2.0	—	D			

Result: The M. L. D. was 0.8 grams per kilo. No abscesses formed though slight local swelling occured in the 0.8 grams dose.

In view of the rather low toxicity of Ambazin on rats it was decided to establish an average dosage of 0.2 grams three times a day for humans. The bacteriological work (see above) and the quite extensive application of this dosage in clinical work seem to justify the selection of this dosage.

(D)—HISTOLOGY

In order to study the effect of Ambazin on the vital organs, such as kidney, liver, spleen, etc., it was decided to put a series of rabbits on an excessive dosage for a prolonged period of time. An amount of 0.6 grams having been established as the daily normal dosage for humans, it will be noted from the table below that Rabbits Nos. 1 and 2 received approximately

ten times this dosage for 40 days and Rabbit No. 5 the same dosage for 46 days. Rabbit No. 3 received ten times this dosage for 26 days and 20 times the dosage for 14 days (proportional to body weight) while Rabbits Nos. 4 and 6 received ten times this dosage for 26 days and twenty times the dosage for 20 days. The time factor as translated to humans would approximately be 400 days or approximately 1.1 year.

The administration to the rabbits was done orally in the form of an aqueous suspension of the compound.

TABLE O

Rabbit No.	Wgt. grams	Dose per per kilo.	Route per admin.	Days administered	Total am't. compound administered
1.	2550	0.040 twice daily	per oral	40 days	8.160 grams
2.	2760	0.040 twice daily	per-oral	40 days	8.832 grams
3.	2400	double dose	per oral	26-0.040 14-0.080	10.368 grams
4.	2900	double dose	per oral	26-0.040 20-0.080	15.312 grams
5.	2550	0.040 twice daily	per oral	46 days	9.384 grams
6.	2600	double dose	per oral	26-0.040 20-0.080	13.728 grams

Results: Rabbits Nos. 1, 2 and 3 were destroyed on the 41st day and Rabbits Nos. 4, 5 and 6 on the 46th day. No staining of the tissues was noted. The stomach, intestines, kidney and urinary bladder were especially studied, but no macroscopical changes could be observed. The other organs, such as lungs, liver and spleen, were apparently normal.

The microscopical findings of the liver, spleen, kidney and lung were:

Rabbit No. 1

Liver—The H and E stained section shows no evidence of any histopathologic changes. The liver cells in the peri-portal region and around the central veins appear to be normal. The blood vessels contain few erythrocytes but not in any excessive amount. The bile ducts also present a normal appearance.

Spleen—There is no evidence in the H and E stained section of any pathologic changes. Most of the malpighian follicles are intact although some of them lost their contour. There is no increase in the interstitial tissue. Hemosiderin is present in normal amount except for one portion of the section where it seems to be somewhat excessive.

Kidney—A section stained with H and E presents no evidence of any pathologic changes. The glomeruli with the vascular tuft present a normal picture. There is no infiltration into the capsular space. The endothelial lining of the capsule is intact, and presents a normal appearance. The epithelial linings of the convoluted and conducting tubules show no degeneration and no cloudy swelling. The luminae of the tubules do not show any casts.

Lung—The H and E stained section shows no evidence of pathology by microscopic examination. The alveolar spaces are clear and show no exudative material. The interstitial tissue as well as the bronchioles likewise show no pathologic evidences. The vessels contain moderate amount of erythrocytes.

Rabbit No. 2

The H and E stained sections of the *Liver, Spleen, Kidney* and *Lung* present similar microscopical picture to the sections in Rabbit No. 1.

Rabbit No. 3

Liver, Spleen and *Lung* sections present microscopical picture similar to those described in Rabbits Nos. 1 and 2 with the exception of slight increase in number of erythrocytes.

Kidney—The H and E stained sections show slight difference from the picture shown in the Rabbits Nos. 1 and 2. Beside the very moderate increase in the number of erythrocytes there is moderate degeneration in the epithelium lining of the convoluted tubules. Also there is a little infiltration of degenerative material in the intercapsular spaces and the luminae of the tubules.

Bladder, intestines and stomach show no histo-pathologic changes in the H and E sections.

Rabbit No. 4

Liver, Spleen, Kidney and *Lung* sections stained with H and E present similar picture as noticed in Rabbit No. 1.

Rabbits Nos. 5 and 6

The H and E stained sections of *Liver, Spleen, Kidney* and *Lung* show the same microsopic changes as described in No. 1.

Interpretation: The microscopical examination of the various sections from the six rabbits shows no evidence of any pathologic changes. These hematoxylin and eosin stained sections included the liver, spleen, kidneys and lungs. The kidney section from Rabbit No. 3 presented slight changes in the glomeruli and the epithelial lining of the tubules but such changes are observed in the kidneys of stock rabbits which have not received any medication.

SUMMARIZATION

The foregoing is a report on the chemistry, bacteriology, pharmacology and histology on a new genito-urinary antiseptic together with a preliminary report on its clinical performance in 100 cases of lower and upper urinary infections.

PHRENICO-EXERESIS IN THE TREATMENT OF PULMONARY TUBERCULOSIS*

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The usual accepted treatment for pulmonary tuberculosis consists of rest in bed, hygiene, nutritious food, sunshine and artificial pneumothorax. Phrenico-exeresis, as one form of treatment in selected cases, was introduced at Oak

*Read before the Chicago Roentgen Society, April 14, 1932.

Forest Tuberculosis Hospital, three years ago.[1] This preliminary report deals only with the results obtained during the past two years. A more complete analysis for publication is being prepared at this time.

Phrenico-exeresis was introduced by Steurtz,[2] in 1911, who cut the phrenic nerve to control basal tuberculosis. In 1920, Goetze[3] suggested temporary paralysis of the diaphragm by crushing the nerve, and in 1922 Felix[4] introduced exeresis or avulsion as it is performed today.

Our material consists of 120 cases of pulmonary tuberculosis in which this operation was performed. The following classes of patients were selected for this procedure:

First, unilateral cases that have taken the usual rest "cure" for about four to six months without definite benefit.

Second, as a preliminary step before artificial pneumothorax because not as much air is needed and therefore the time between refills is lengthened, the subsequent pleural effusions are smaller and occur less often, and finally when the lung is allowed to re-expand there is less chance for tearing open healed cavities.

Third, in those cases in which there is cavity formation of the following types, soft walled, honey-combed cavities located any place in the lung and persistent cavities that do not disappear under ordinary management. The purpose of phrenico-exeresis in such cases is to relieve tension, thus permitting the cavity to become smaller or closed.

Fourth, to control pulmonary hemorrhage where pneumothorax was attempted and failed.

Fifth, as a safeguard for patients who are unable to receive proper pneumothorax care after leaving the hospital because of transient residence, occupations, or any other inability to receive gas refills.

Sixth, in cases where pneumothorax is unsuccessful because of the presence of pleural adhesions and inability to collapse the lung.

Seventh, as a preliminary step before thoracoplasty to test the response of the better lung.

We do not perform the operation in the presence of undrained empyema because fluid is noncollapsible. In acute progressive tuberculous disease and in tuberculosis with complications such as intestinal tuberculosis or laryngeal tuberculosis, we feel that phrenico-exeresis is contraindicated because in such cases the process is already very far advanced. Cases with thick walled cavities are not suitable because they cannot be collapsed by phrenico-exeresis. In bilateral pulmonary tuberculosis which is very active and progressive, except for the unusual case in which a bilateral phrenico-exeresis is deemed advisable, we also feel that this procedure is contraindicated.

The technique employed consists of the following: A site is selected where the cosmetic changes will not be prominent. There is usually a natural small wrinkle transversely two finger breadths above the clavicle. Local anesthesia is employed, infiltration of the skin, subcutaneous tissue and deeper layers is accomplished with one per cent. novocain solution. The incision is made to coincide with the transverse wrinkle described above, beginning just at the posterior border of the sternocleidomastoid muscle and running backward about one and one-half inches (4 cm.).

The skin, superficial fatty layer, and platysma muscle are incised and the small vessels of the skin are clamped. The artery forceps are permitted to remain until the operation is completed in order to provide hemostatis without the use of ligatures in the superficial layers. The rest of the operation is performed by blunt dissection, with blunt nosed Mayo scissors. (Fig. 1.)

The external jugular vein is located and is retracted to one side, preferably anteriorly. The

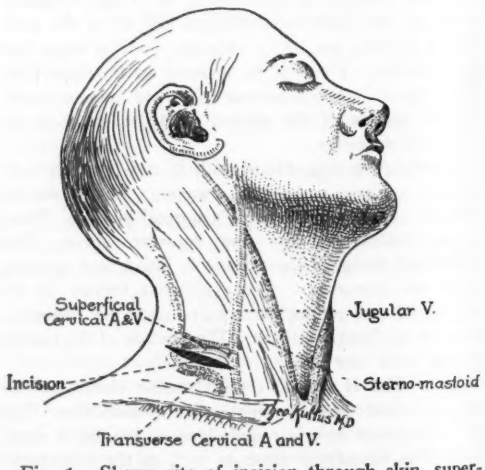

Fig. 1. Shows site of incision through skin, superficial fat and platysma muscle and indicates relations of deeper structures.

finger is now introduced into the wound, the rounded belly of the scalenus anticus muscle is identified and the dissection is then carried down directly to the surface of this muscle. The phrenic nerve will then be easily found lying on this muscle.

Once safely oriented, the retractors are so introduced that this muscle is now firmly held in

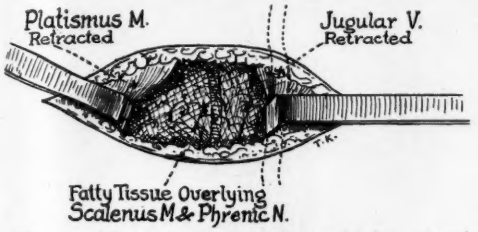

Fig. 2. Illustrates pad of fat overlying phrenic nerve. This fat should never be excised but is best separated by blunt dissection.

place. The fascia is incised and the opening enlarged by spreading the points of the instrument. A pad of fat will always be found overlying the muscle. This fat should never be incised but is separated by blunt dissection only and the anterior scalene is exposed. (Fig. 2.)

If the anatomy is normal, the nerve will be seen at once crossing the surface of the muscle diagonally from without inward, covered by a thin transparent layer of fascia. However, this is not always the case, as the nerve may be higher up, descending along the anterior border or along the posterior margin of the muscle to cross lower down. The former variation is the more common.

After the nerve is found, it is picked up by a hook and is identified by using a weak faradic

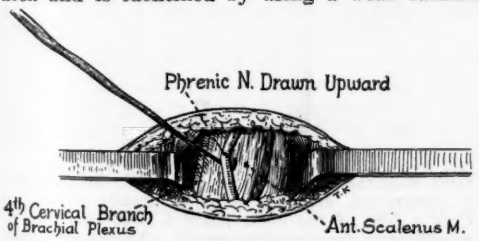

Fig. 3. Illustrates exposure and seizure of phrenic nerve for electrical stimulation. This is very important in order to avoid confusion with the 4th cervical branch of the brachial plexus which lies alongside the phrenic nerve.

current. The negative contact is put on any part of the body and the positive electrode on the nerve. The nerve is then stimulated and the diaphragmatic contraction or twitch of the abdominal wall is observed or felt just below the costal margin; a drop or two of novocain is then injected into the nerve before clamping the structure with a hemostat. (Fig. 3.)

The pupils are now observed in order to determine if they are unequal and if drooping of the eyelid occurs, as would be the case if the sympathetic nerve is confused with the phrenic. This is a second safeguard in the identification of the phrenic nerve.

If a temporary paralysis of the diaphragm is desired, the nerve is crushed with a hemostat for about one-half to one inch. We do not believe that the above procedure is desirable because the nerve may regenerate in from one to eight months and paralysis of such duration is usually insufficient. If a permanent result is sought, the nerve is fully freed from the muscle surface and clamped with a large hemostat. It is then severed above the hemostat and the distal end is subjected to steady, firm traction and rolling on the hemostat, as illustrated. (Fig. 4.)

The attachment of the phrenic nerve to the diaphragm will often give way and the entire nerve may thus be removed. In some cases this does not occur so readily or is impossible. In

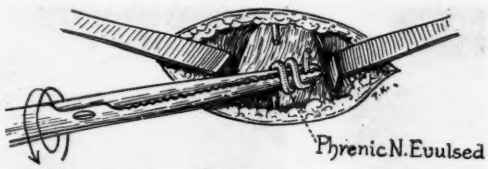

Fig. 4. Shows method for avulsion of nerve after identification.

such instances as the latter, about ten to twelve centimeters of the nerve is avulsed. We feel that this is enough in the majority of cases to insure breaking of the accessory connections and we feel safe in cutting the nerve at this point.

Occasionally following the avulsion there is a welling up of blood in the operative field, from the point where the nerve was extracted. This is usually caused by the tearing of the transverse cervical artery or vein. This hemorrhage can be stopped readily by a little pressure with gauze packed into the wound for a few minutes. When the wound is dry, it is closed by subcuticular continuous suture of silk without drainage. Only rarely are ligatures required. A small piece of gauze dipped in collodion is placed over the wound and this is covered by a piece of dry

gauze held in place by adhesive plaster. Sutures are removed at the end of five days.

Certain post-operative complications occur, such as Honer's Syndrome with drooping of the eyelids, pinpoint pupils and slight flush of the affected side of the face. This occurred once. Gas pains and indigestion lasting from two days to a week, occurred frequently in phrenico-exeresis performed on the left side. Hemorrhage from the transverse cervical vein or artery or superficial cervical vessels occurred in five instances but was easily controlled.

Summary.—During the past two years, phrenico-exeresis was done in 120 selected cases of pulmonary tuberculosis. 67.5% of these cases showed definite improvement as evidenced by the sputum becoming negative. normal temperature, gain in weight and improvement in physical

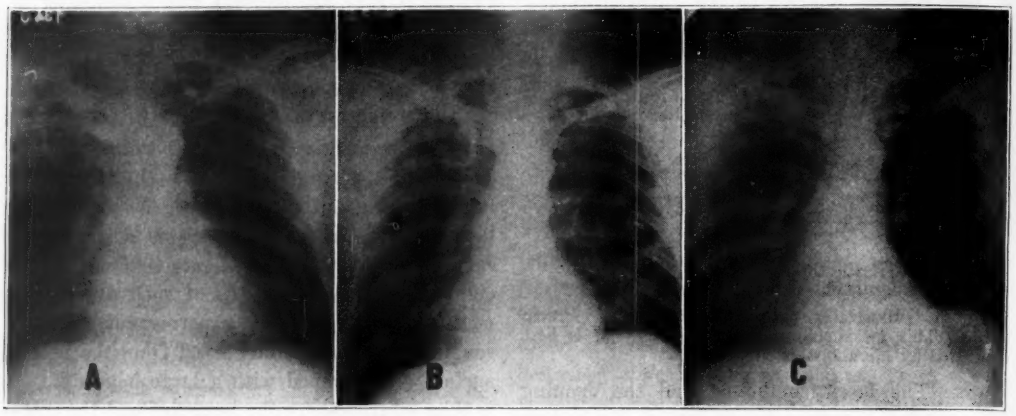

Fig. 5. White male, age 52, far advanced pulmonary tuberculosis, sputum positive. X-ray findings indicate cavities in right upper lobe, but there were practically no physical findings in this area. The physical findings were all in the apex of the left lower lobe. A left phrenico-exeresis was performed. A shows appearance of chest at the time of admission 8-7-30. B shows paralysis of left diaphragm, compression of left lung, disappearance of parenchymal infiltration in left lung and partial obliteration of cavities in right upper lobe. This examination was made 5-2-31. C illustrates appearance of chest 2-10-32. Paralysis of left diaphragm persists, left lung roentgenologically and clinically negative, and the cavities in the right upper lobe are obliterated and the site densely fibrosed. At this time a series of sputum exams were all negative.

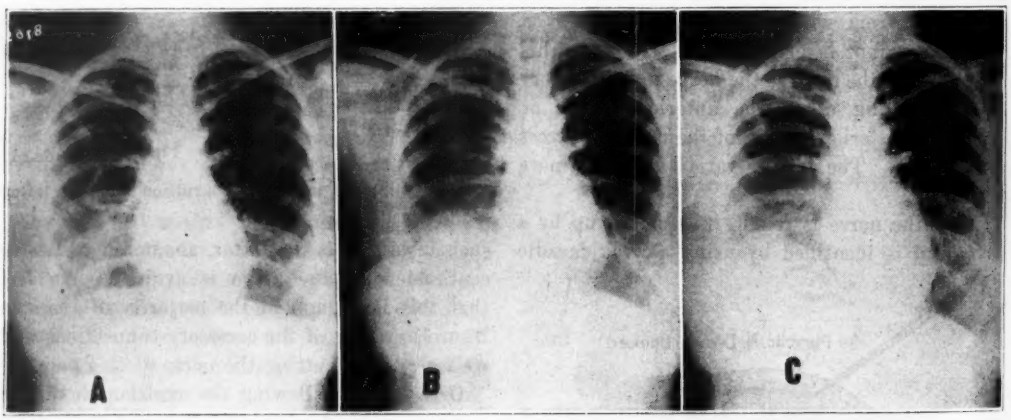

Fig. 6. White female, aged 24, far advanced pulmonary tuberculosis, positive sputum, physical findings and X-ray examination revealed a far advanced process on both sides. There is a large cavity in the right middle lung field. A shows appearance of chest on 10-8-31. Phrenico-exeresis was done 11-16-31 and eight days later (11-24-31) the second film B was made. The right diaphragm is high and paralyzed, the right lung is compressed, and the cavity is greatly compressed. C is a film of the chest made 4-11-32 or about six months after the phrenico-exeresis. The cavity is completely obliterated, the diaphragm remains high and the lung is compressed. At this time the sputum was negative, the patient had gained 67 pounds and clinically the process was arrested.

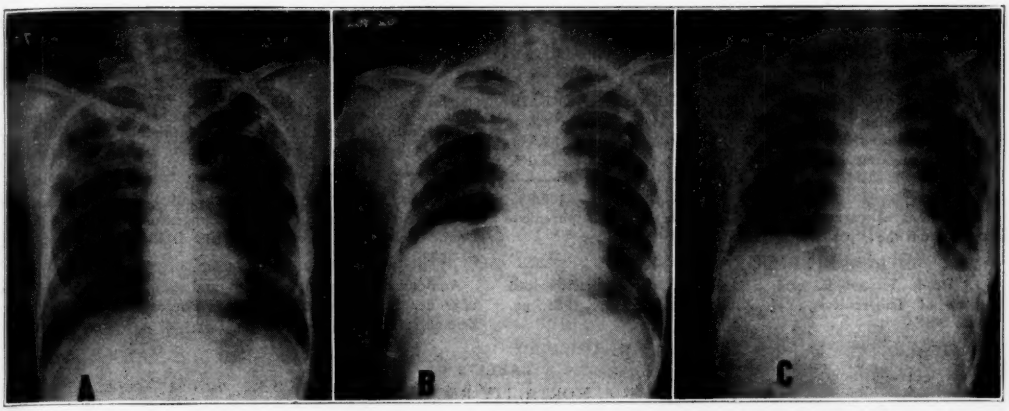

Fig. 7. White female, age 23, far advanced, active, bilateral pulmonary tuberculosis. A shows the appearance of the chest on admission 2-9-31. A large infiltration is present in the left apex and a large cavity is present in the right apex. B illustrates the appearance of the chest on 12-14-31. The right diaphragm is high and paralyzed, the right lung is compressed, the heart is displaced slightly to the left and the cavity is completely obliterated and fibrosed. It will be noted that the infiltration in the left apex is disappearing also. C shows the appearance of the chest on 4-11-32. Only the fibrosis in both upper lobes remains. The sputum was persistently negative, the temperature normal, there was a marked gain in weight and clinically the case was considered to be arrested.

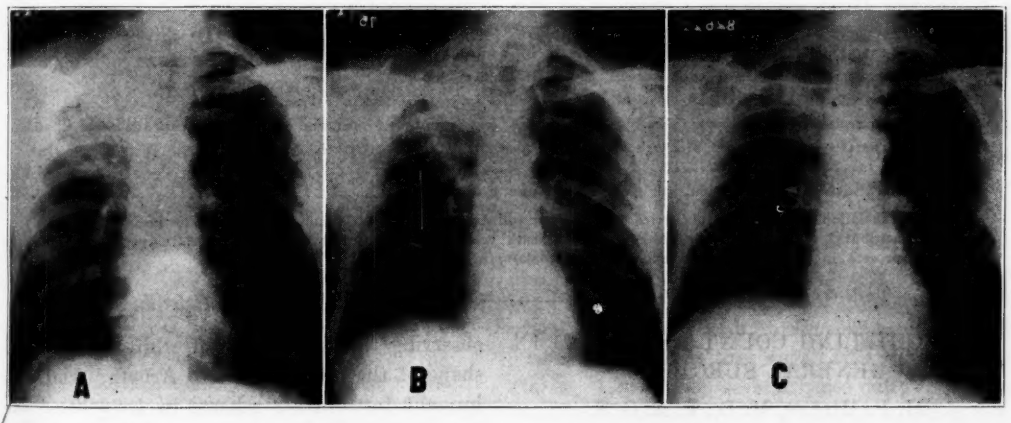

Fig. 8. White male, age 41, positive sputum, the clinical and X-ray findings were those of an advanced right upper lobe tuberculosis with multiple small cavities and marked soft parenchymal infiltration. A shows appearance of chest at the time of admission 10-15-30. B. illustrates the X-ray appearance of the chest about two months after the phrenicoexeresis. There is the characteristic elevation and paralysis of the right diaphragm and the displacement of the mediastinal structures. Much dense fibrosis is present in the right apex and the cavities can no longer be visualized. C. is the appearance of the chest on 11-24-31. There is complete arrest of all activity, nothing but dense fibrosis remains at the site of the cavitation and infiltration. The sputum was negative, temperature was normal, the patient has gained more than twenty pounds, and the condition is clinically arrested.

findings; 62.5% became "negative sputum" after phrenico-exeresis; 39 or 32.5% remained "positive sputum." Of these 39 cases, 18 were subsequently given artificial pneumothorax and 6 or 33⅓% of these gas cases were discontinued because of adhesions, pleural effusions, etc. Of the 120 cases discussed in this paper and followed up, 18 or 15% are now dead from causes enumerated in the appended tables. (Tables 1 and 2.) No mortality or morbidity can be attributed directly to a phrenico exeresis. A complete analysis of the cases studied with histories, clinical course etc., will follow in a subsequent publication.

Conclusions.—From the results obtained in a series of 120 selected cases of pulmonary tuberculosis, we feel that phrenico-exeresis should precede all other surgical procedures in the treatment of pulmonary tuberculosis. A series of roentgenograms of illustrative cases showing the

types of cases selected for treatment and the results obtained is included. Figs. 5-8.

TABLE 1

SPUTUM REPORT FOLLOWING PHRENICO-EXERESIS

Positive becoming Negative	75	or	62.5%
Positive remaining Positive	39	or	32.5%
Negative remainng Negative	6	or	5.0%
	120		100.0%

Tabulation of cases treated to illustrate effect of phrenico-exeresis on the "positive sputum" cases.

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TABLE 2

MORTALITY RECORD

Number of Patients 120. Number of Deaths 18. Percentage of Deaths 15%.

NO DEATHS OCCURRED THAT CAN BE ATTRIBUTED DIRECTLY TO THE OPERATION

Analysis of Deaths

No. of Cases:		Per Cent
6.	Following Phrenico-exeresis and thoracoplasty—the Phrenico-exeresis being in each case done in preparation for thoracoplasty	33%
2.	Following Phrenico-exeresis and a subsequent operation on the recurrent laryngeal nerve for T. B. Throat	11%
3.	Artificial pneumothorax attempted unsuccessfully. Phenico-exeresis was then done	17%
2.	Phrenico-exeresis of left side—followed subsequently by a spontaneous pneumothorax on same side	11%
1.	Phrenico-exeresis in unilateral case—patient had a tubercular hip	5.5%
1.	Phrenico-exeresis in unilateral case—patient died 5 months later (this was a colored man)	5.5%
1.	Phrenico-exeresis (bilateral case). An old patient with reactivation and operation was done at patient's request	5.5%
1.	Phrenico-exeresis—resulting in Horner's Sydrome—subsequently given Artificial Pneumothorax. Died of air embolism	5.5%
1.	Died after leaving the Institution, one year later, cause unknown	5.5%

Tabulation of deaths in this series of cases. It will be noted that no deaths are directly or indirectly attributed to the phrenico-exeresis, but that death was due to continued advance of the tuebrculous process in spite of phrenico-exeresis, thoracoplasty or both.

THE SCHILLING COUNT AS AN AID IN GENERAL SURGERY*

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ROCK ISLAND, ILLINOIS

The purpose of this article will be to stress the value of the Schilling hemogram in general surgery as an aid in diagnosis, prognosis, and clinical observation. My experience with routine hematological observation of surgical cases has shown ample justification for the extra time, expense and effort involved. I will attempt to show in the following paragraphs the type of reaction found in the blood in clean and infected surgical cases and explain the interpretation of the leukocytic changes.

Credit for the propounding of the principle of observing the immaturity of white cells by the shape of the nucleus goes to Arneth,[1] who first brought forward his scheme in 1892 after Erlich had perfected the blood stain which made the differential count possible. Because of the impractibility of Arneth's classification it was never popularized until Schilling[2] in 1911 simplified the classification into what is now known as the Schilling differential count. Isolated investigators, among whom may be mentioned Retznikoff,[3] Weiss[4] and Boies[5] have written articles which show the value of the count in their types of work, i. e., internal medicine and eye, ear, nose and throat specialties. The general surgeons have not utilized the new method very widely.

Arneth observed an increase in the number of immature leukocytes in the presence of infection with a shift back to the more mature cells as in-

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fection was overcome. The polymorphonuclear neutrophiles are considered to be the mature type in the Schilling classification, ignoring the many subdivisions of Arneth, and are called segmented leukocytes. Forms which have not quite reached maturity have no segmentations in the nucleus, the nuclei often assuming the shape of a bent rod and are known as the staff forms. The next cells in the scale of immaturity are slightly larger than the staff forms and have a fainter staining protoplasm with a nucleus which is slightly indented but with more of a tendency to be round and fainter staining than the staff forms; these are called juveniles. The next subdivision in the Schilling count is the typical myelocyte. The myelocytes are normally absent from the peripheral blood. Juveniles are rarely present up to as high as one-half of one per cent.; the staff forms occur normally up to five per cent. The remainder of the polymorphonuclear neutrophils are made up of unsegmented forms. The usual classification of the remainder of the white count into basophiles, eosinophils, lymphocytes and large monoculears is also made. The total white count numerically is not so important as the simple statement of increased, normal or decreased to be taken into consideration in the interpretation of the hemogram.

A typical normal hemogram with limits of variation would appear as in Table 1.

TABLE 1.

Total Count	Bas.	Eos.	Myelo.	Juv.	Staff	Seg.	Lymph.	L.M.
6,000 to	.5%	3	0	5%	4%	67%	23%	6%
10,000	(0-1)	(2-4)		(0-1)	(3-5)	(54-72)	(21-35)	(4-8)

If we should place the immature cells on a horizontal line with the immature towards the left and mature cells towards the right, we would have an arrangement as shown in Plate 1.

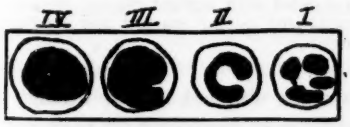

PLATE 1

1. Segmented cell.
2. Staff form.
3. Juvenile type.
4. Myelocyte.

Using Arneth's hypothesis, with this scheme in mind, the presence of infection would mean an increase in the immature forms or shift to the left; the subsidence of infection a shift back to the multinucleated forms or shift to the right.

One investigator[4] has aptly stated that the differential count is the mirror of the sum total of physiological destruction and replenishment of the blood stream. The destruction may be assumed as being caused by a foreign agent either toxic or bacterial. The replenishment must come from the bone marrow in the case of the granulocytic leukocytes as shown by Florence Sabin.[6] According to her work the classes of immature granulocytes exist in the bone marrow in fairly constant levels starting with the myeloblast and passing up through more mature forms such as myelocyte A, B and C, the metamyelocyte and mature leukocytes. Only a small quantity of mature leukocytes are present in the bone marrow in amount sufficient to take care of the normal physiological requirements of the blood stream. In the presence of severe infection the reserve store is insufficient to supply the demand due to increased destruction. As a result, when such a strong stimulus occurs, immature cells may be thrown into the blood stream in order to meet the demand; because there is insufficient time for complete maturation. Obviously, the greater the demand and less adequate the bone marrow, the more immature the cells thrown into the blood stream will be; and we observe the shifting to the left from staff forms to juveniles and even to the appearance of myelocytes in severe infections. With this mechanism in mind we can clearly see that serial differential counts taken daily or even several times daily in closely watching the progress of a critical infection will indicate this shifting into immature cells with an increase in staff, juveniles, myelocytes where the prognosis becomes worse; and reversion back through these various steps to the mature forms as recovery occurs.

In addition to the granulocytic system, the Schilling hemogram takes into consideration the lymphocytic and the reticulo-endothelial systems in the lymphocyte count and the large mononuclear count. A definite biological chain of events occurs in these systems in the presence of a toxic or infective agent. Schilling speaks of the initial stage of granulocytic reaction as the combat phase. With the drop in the number of immature cells the monocytic system is stimulated, as evidenced by a transitory rise of mono-

nuclear cells, along with the return of the eosinophiles which had been depressed along with the monocytes. This transitory monocytosis occurring as the shift to the left falls is called the stage of conquest by Schilling and indicates beginning recovery. Following the short monocytic phase the monocytes drop back to normal and a gradual increase of lymphocytes occurs with the onset of convalescence. Therefore, in the convalescent stage, the immature count has returned to normal, the eosinophiles and monocytes have dropped to normal; and a lymphocytosis is present. In the presence of a chronic infection or in an infection that has not completely subsided, the granulocytes may remain slightly high and the monocytes and eosinophiles may remain high with a lymphocytosis, indicating that the process has subsided but still causes chronic irritation. Plate two taken from an actual surgical case illustrates the various phases.

The great value of understanding the mechanism of these leukocytic reactions as brought out in the preceding paragraphs lies in the interpretation of serial counts made either for diagnosis or for clinical observation of the progress of a case. For the last two years I have been following routinely with serial Schilling counts before and after operation all types of surgical cases both clean and infected. The results of these observations have been published elsewhere,[7] and have been amply sufficient to convince me of the valuable assistance to be gained by this work. Complications can often be predicted twenty-four hours before they are evident to clinical observation. Likewise, in critical surgical cases, where considerable concern may be felt during the first few days, are observed to pass through the normal sequence of hemotalogical reactions if all is going well.

In order to illustrate these facts I will report several typical cases with serial blood counts taken twice daily till the stage of convalescence has well advanced. It will be observed from a study of the tables that a clean surgi-

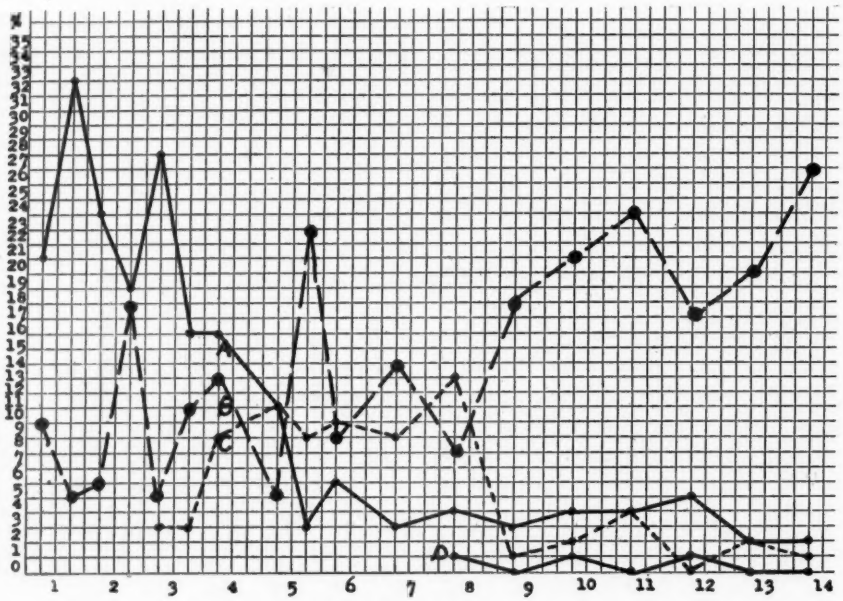

PLATE 2

A—Immature cells.
B—Lymphocytes.
C—Mononuclear cells.
D—Eosinophiles.

Mr. V. DeW. Perforated duodenal ulcer. Closure of perforation two hours after onset. Uneventful recovery. Graphic chart to show the sequence of leukocytic changes. The point at which the monocyte phase began coincided with marked clinical improvement further emphasized by the marked and consistent fall in immatures.

cal operation acts as an irritant and produces the sequence of changes much like an infection. The irritation, trauma with resultant decomposition products, and absorption of suture material is responsible. The great value lies in the fact that a complication will upset the orderly progression of cellular changes.

Case two shows the same reactions in another uncomplicated operative case. The shift extends a little more to the left and lasts longer, accompanied by a higher postoperative temperature due to stirring up dormant infection. The clinical course was uncomplicated and the phases follow each other in an orderly manner.

CASE 1.

Count Number	Date	Time	Total Count	Myelo	Juv	Staff	Seg	Mons	Bas	Eos	Lymph	Shift	Temp	Clinical Course
1	2-10-32	10:00 p. m.	8,400	..	..	1	58	5	..	1	35	1	98	Admitted
2	2-11-32	8:00 a. m.	....	..	..	2	67	1	..	2	28	2	100	Appendectomy
3	2-11-32	8:00 p. m.	....	1	4	1	79	..	..	..	15	6	100.4	Usual Course
4	2-12-32	7:30 a. m.	....	..	2	3	79	1	..	..	15	5	99.6	" "
5	2-12-32	8:00 p. m.	....	..	..	1	79	18	..	..	2	1	100.6	" "
6	2-13-32	8:00 a. m.	17,700	..	..	3	78	12	..	1	6	3	98	" "
7	2-13-32	7:00 p. m.	....	..	..	1	92	3	..	..	4	1	100	" "
8	2-14-32	8:00 a. m.	....	..	..	7	44	4	..	..	45	7	98.6	" "
9	2-14-32	7:00 p. m.	....	..	..	9	61	..	..	..	31	9	100	" "
10	2-15-32	8:30 a. m.	4,700	..	..	2	70	6	..	3	20	2	98.4	" "
11	2-15-32	8:00 p. m.	....	..	..	4	64	2	..	6	24	4	99	" "
12	2-16-32	8:30 a. m.	....	..	..	3	65	..	..	3	29	3	99.2	" "
13	2-17-32	8:00 p. m.	....	..	2	4	59	2	2	4	28	6	99	" "
14	2-19-32	8:00 a. m.	....	1	2	3	63	..	2	7	22	6	98.8	" "
15	2-21-32	8:00 a. m.	....	..	..	2	67	..	..	2	30	..	98.6	" "

Mr. J. J., white, painter. Appendectomy for recurrent appendicitis. Uncomplicated course.

CASE 2.

Count Number	Date	Time	Myelo	Juv	Staff	Seg	Mons	Eos	Lymph	Shift	Temp	Clinical Course
1	2-4-32	8:00 a. m.	..	..	2	69	6	5	18	2	98	Salpingectomy
2	2-4-32	7:00 p. m.	..	..	8	90	..	..	2	8	101.6	Good condition
3	2-5-32	8:00 a. m.	..	..	5	89	2	..	6	5	99	Mod. drainage
4	2-5-32	7:00 p. m.	..	4	4	77	2	..	9	8	100.6	Usual Course
5	2-6-32	8:00 a. m.	..	4	13	54	22	..	8	17	99	No complications
6	2-6-32	7:00 p. m.	..	1	17	53	17	..	5	18	101.2	" "
7	2-7-32	8:00 a. m.	..	3	13	48	12	..	23	16	100	" "
8	2-8-32	8:00 a. m.	..	3	9	52	8	1	27	13	100.2	Sl. drainage
9	2-9-32	8:00 a. m.	..	2	12	56	..	..	30	14	100.4	Condition good
10	2-10-32	8:00 a. m.	..	4	4	66	4	..	22	8	101	" "
11	2-12-32	8:00 a. m.	..	..	5	76	1	2	16	5	99.6	" "
12	2-14-32	8:00 a. m.	..	..	3	58	4	4	31	3	99	" "
13	2-16-32	8:25 a. m.	..	1	3	55	2	5	34	4	98.6	" "

Mrs. M. M., age 29, divorced, phone operator. Diagnosis: chronic salpingitis. Operation: appendectomy, bilateral salpingectomy. Uncomplicated post operative course.

Case one is a typical example of the normal reactions in an uninfected surgical case. Noteworthy factors are the slight shift to the left seen the second and third day; followed by a monocytosis, as the shift drops, lasting for twenty-four hours. The striking thing is the height of the monocytic percentage, 18%. This reaction is missed completely if frequent counts are not done. With the drop of the monocytes a lymphocytosis occurs which persists in the stage of convalescence. Eosinophiles appear soon after the lymphocytes and rise to a height of seven per cent. The maximum shift corresponds roughly to the highest part of the temperature curve; while the monocytosis, lymphocytosis and eosinophiles parallel the return to normal and improvement in the clinical condition.

Case three represents a deviation from normal. First of all one sees the slight shift to the left on the second and third day expected in an appendectomy but the monocytic phase does not appear. This should put one on the alert for a complication. True to form, two days later, a sore throat appeared and a typical acute follicular tonsillitis with temperature of 102 developed. With subsidence of this, the monocytic phase along with slight increase in eosinophiles appeared, commencing with improvement in the patient's clinical condition. Definite lymphocytosis were still absent when the patient was last examined.

Case four and case five illustrate another type of reaction. Both cases were in the hospital at a time influenza was very prevalent. Both were

CASE 3.

Count Number	Date	Time	Total Count	Myelo	Juv	Staff	Seg	Mons	Eos	Lymph	Shift	Temp	Clinical Course
1	2-16-32	7:30 p. m.	....	..	..	1	68	..	1	30	1	98	Admitted
2	2-17-32	8:00 a. m.	9,100	..	..	4	55	..	1	40	4	98.8	Appendectomy
3	2-17-32	8:00 p. m.	....	..	..	2	90	..	..	8	2	98.6	Normal course
4	2-18-32	8:00 a. m.	....	1	2	1	88	..	..	8	4	99	Slight cough
5	2-18-32	7:00 p. m.	....	..	5	2	82	..	..	11	7	100.4	" "
6	2-19-32	8:00 a. m.	12,800	..	2	1	86	..	1	10	3	98	" "
7	2-19-32	7:00 p. m.	....	..	8	2	66	..	..	24	10	99.6	" "
8	2-20-32	8:00 a. m.	....		1	1	72	..	..	26	2	98.6	" "
9	2-20-32	7:00 p. m.	....	..	2	0	75	1	..	22	2	99	" "
10	2-21-32	8:00 a. m.	....	..	1	2	79	..	1	17	3	97.8	Sore throat
11	2-21-32	7:00 p. m.	....	..	1	1	76	..	1	20	2	98.4	" "
12	2-22-32	8:00 a. m.	10,300	..	4	1	87	..	1	7	5	99.6	" "
13	2-23-32	8:00 a. m.	....	..	1	4	86	..	1	7	5	99.8	" "
14	2-23-32	7:00 p. m.	....	..	4	7	69	..	..	22	11	102	Tonsillitis
15	2-24-32	8:00 a. m.	....	..	1	5	72	..	1	21	6	98.6	Feels better
16	2-24-32	7:00 p. m.	....	4	5	11	63	..	..	17	20	99.4	" "
17	2-25-32	8:00 a. m.	....	3	4	6	71	..	1	15	13	98.8	Throat cleared up
18	2-26-32	10:00 a. m.	....	..	..	7	74	14	..	5	7	98.4	No complaints
19	2-27-32	7:00 a. m.	....	..	..	9	67	12	1	11	9	98.6	Out of bed
20	2-28-32	7:00 a. m.	....	..	..	10	63	4	2	21	10	98.2	Left hospital
21	3-2-32	3:00 p. m.	....	..	..	5	61	7	2	25	5	98.6	At office

Mr. R. H., white, dairy worker, age 23, appendectomy for recurrent appendicitis; interval case. Course complicated by follicular tonsillitis.

CASE 4.

Count Number	Date	Time	Total Count	Myelo	Juv	Staff	Seg	L.M.	Eos	Bas	Lymph	Shift	Temp	Clinical Course
1	3-3-32	8:00 a. m.	7,400	..	..	6	63	6	1	1	22	6	97	Preop.
2	3-3-32	8:00 p. m.	....	..	..	5	82	7	..	..	7	5	98.8	Appendectomy
3	3-4-32	7:00 a. m.	....	..	1	11	74	9	..	..	5	12	99.8	Usual Course
4	3-4-32	7:00 p. m.	....	..	..	5	74	11	..	1	9	5	101	Bronchitis
5	3-5-32	8:00 a. m.	13,800	..	..	10	69	15	..	1	5	10	99.8	Coughing
6	3-5-32	8:00 p. m.	....	..	..	6	60	24	..	1	10	6	100.4	"
7	3-6-32	7:00 a. m.	....	..	..	3	71	12	1	1	12	3	98.8	"
8	3-6-32	7:00 p. m.	10,300	..	..	3	72	19	..	1	5	3	99.4	Normal course
9	3-7-32	8:00 a. m.	....	..	..	7	73	10	1	..	9	7	100.2	except cough
10	3-8-32	7:00 a. m.	....	..	..	3	56	19	2	1	19	3	100.4	Normal course
11	3-12-32	8:30 a. m.	....	..	..	3	61	13	2	..	21	3	100	except cough
12	3-15-32	8:00 a. m.	....	..	..	1	73	7	..	2	7	1	98.6	Slight cough

Mrs. A. W., white, housekeeper, age 62. Diagnosis: recurrent appendicitis, cholelithiasis. Appendectomy performed. Complicated by acute bronchitis and common cold starting third post-operative day.

CASE 5.

Count Number	Date	Time	Total Count	Myelo	Juv	Staff	Seg	L.M.	Eos	Bas	Lymph	Shift	Temp	Clinical Course
1	2-27-32	7:00 p. m.	....	..	1	6	79	8	..	..	6	7	97.8	Operation
2	2-28-32	8:00 a. m.	....	..	..	1	89	4	..	..	6	1	97.8	Condition good
3	2-28-32	7:00 p. m.	....	..	1	1	83	..	..	..	15	21	100.6	No swelling
4	2-29-32	8:00 a. m.	....	..	1	1	90	8	..	..	..	2	98.8	Circulation gd.
5	2-29-32	7:00 p. m.	....	..	..	1	73	..	1	1	24	1	100.4	Condition good
6	3-1-32	7:15 a. m.	....	..	..	3	78	3	..	..	19	3	97.6	" "
7	3-1-32	7:00 p. m.	....	..	..	5	75	3	..	..	17	5	100.6	" "
8	3-2-32	8:00 a. m.	....	..	..	8	58	4	..	..	30	8	100	Sl. cough
9	3-3-32	8:00 a. m.	....	..	..	3	72	14	1	1	7	3	99.6	Coughing
10	3-3-32	8:00 p. m.	....	..	..	1	74	17	..	1	7	1	100.6	"
11	3-4-32	8:00 a. m.	8,200	..	..	8	75	9	..	..	8	8	101.4	Influenza
12	3-4-32	8:00 p. m.	....	..	..	8	67	9	..	4	12	8	103	Coughing
13	3-5-32	8:00 a. m.	....	..	..	2	73	10	1	..	14	2	101.4	Expectoration
14	3-5-32	7:00 p. m.	....	..	..	6	67	14	2	2	9	6	102.4	"
15	3-6-32	7:00 a. m.	....	..	..	6	66	3	..	..	25	6	100.6	"
16	3-6-32	7:00 p. m.	....	..	..	6	62	16	..	..	16	6	102.4	"
17	3-7-32	8:00 a. m.	....	..	..	5	60	10	..	..	24	5	98.2	Feels better
18	3-7-32	7:00 p. m.	....	..	..	4	68	10	..	1	17	4	99.8	Less cough
19	3-8-32	8:00 a. m.	....	..	..	7	67	14	2	..	9	7	98	Still cough
20	3-8-32	7:00 p. m.	....	..	..	3	72	8	2	..	15	3	99.2	" "
21	3-9-32	7:00 a. m.	....	..	..	6	49	31	3	1	10	6	98.6	New cast
22	3-10-32	7:00 p. m.	....	..	1	7	58	3	..	..	31	8	99.4	applied with
24	3-14-32	7:00 p. m.	....	..	..	2	75	6	1	..	18	0	99	walking iron
							71	1	1	..	26	2	98.4	Out of bed

Mrs. B. M., age 72, widow, housekeeper. Diagnosis: fracture of patella. Suture of patella and application of cast. Development of influenza and bronchitis sixth post-operative day.

clean surgical cases complicated by bronchitis with high temperature and low total count and diagnosed as influenzal bronchitis. A monocytosis persisted, after the usual postoperative shift to the left and subsidence, until the bronchitis was well, followed by a return of aeosinophiles and lymphocytosis.

Summary

The theory, morphology and interpretation of the Schilling differential count has been discussed. The application has been demonstrated in a series of five illustrative surgical cases in which routine counts were made twice daily. The importance of observing all parts of the differential count, not merely the rise and fall of the staff count alone, is stressed. Emphasis is placed on the fact that a variation from the normal sequence of cellular reaction should put one on the alert for a complication. The monocytes and eosinophiles are extremely sensitive, indicators of the stimulation and defense reactions going on. An abnormal variation appears twenty-four to forty-eight hours before symptoms are apparent in the clinical condition.

St. Anthony's Hospital.

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RETROPHARYNGEAL ABSCESS

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Retropharyngeal abscess is not an uncommon condition. Within the last three years I have treated five cases of this type in a general surgical practice. I have also assisted Dr. George de Tarnowsky in two complicated cases where an incision in the neck was necessary to drain the abscess.

The chronic type of retropharyngeal abscess occurs as a result of tuberculosis of the cervical vertebra. These are slow in onset and are of the same mechanism as psoas abscess, except that the former produces marked dyspnea and dysphagia. These cases require immediate evacuation of pus because of the danger of extension into the mediastinum.

Acute retropharyngeal abscess is manifested clinically by a very septic condition. It is caused by a secondary infection of the lymph vessels and glands in the retropharyngeal space. This space is located between the pharynx and vertebra, is bounded above by the base of the skull and extends behind the esophagus into the posterior mediastinum. The prevertebral fascia, along the medial aspect and parallel to the carotid sheath, gives off a thin lamina which is called the buccopharyngeal fascia. This closely covers the constrictor muscles of the pharynx and continues forward from the constrictor pharyngis superior on to the buccinator. The buccopharyngeal fascia is attached to the prevertebral fascia by loose connective tissue and thus produces an easily distended space between them. This space is called the retropharyngeal space. The retropharyngeal glands are one to three in number and are bilateral. They are located in this space behind the upper part of the pharynx and in front of the arch of the atlas, separated from the latter by the longus capitis muscle. The afferent vessels from the retropharyngeal glands drain the nasal cavity, the nasal part of the pharynx, auditory tubes and the middle ear. The efferent vessels pass to the superior deep cervical glands.

Etiology. Retropharyngeal abscess may occur at any age, though it is more common among children. This condition is often associated with scarlet fever, measles, diphtheria and erysipelas. The most common causes are inflammation of the tonsils or pharynx, osteomyelitis of the body of the cervical vertebra and otitis media. As the middle ear empties into the retropharyngeal glands, the association of otitis media is easily explained.

Symptoms. There is a high elevation of temperature in all cases of acute retropharyngeal abscesses. Sore throat is an early symptom in the majority of patients. Pain and rigidity of the neck with enlargement of the cervical glands is always present. The glands are painful to palpation. Chills are present in some cases.

Dyspnea, dysphagia and aphonia are late symptoms, though some difficulty in breathing may be present quite early. Crowing respiration is quite diagnostic of this condition.

A grunting and rattling sound in the throat is present in the late stage. The patient usually breathes with his mouth slightly open and unsuccessfully attempts to clear his throat of the large accumulation of mucus and saliva. Dribbling of saliva from the corner of the mouth was present as a late symptom in one of our cases. Air hunger and cyanosis are late symptoms.

The patient is restless in the beginning of the disease, but becomes extremely quiet in the latter stage. As the disease progresses, the cervical glands become larger, more painful and may fluctuate.

Rapidity of pulse and respiration are present in almost all cases.

The blood count reveals a leukocytosis with an increased number of polymorphonuclear neutrophils. Albuminuria is generally present.

Diagnosis. The accumulation of mucus in the throat should be cleaned out before attempting examination. A good light is essential for a satisfactory examination of the throat. Redness and swelling of the tonsils and uvula with ulceration and patches over them sometimes complicates the diagnosis. The diagnosis of retropharyngeal abscess becomes quite simple when a swelling in the posterior or lateral wall of the pharynx is found. The posterior wall bulges forward and accounts for the obstructive symptoms. The swelling may be low down in the pharynx, so that the base of the tongue should be strongly depressed in order to get a good view. Palpation of the abscess for fluctuation is of great aid in diagnosis, though not always possible.

Various organisms may be isolated from the pus. Strepto-, staphylo- and pneumococcus were the common ones found in our cases.

Paratonsillar abscess may be associated with this condition.

In cases of croup in children the possibility of retropharyngeal abscess should be kept in mind.

Complications. A retropharyngeal abscess, when not recognized, may extend further down to the posterior surface of the esophagus and then continue to the posterior mediastinum and end into a mediastinal abscess.

It may extend to the deep cervical glands and form a large, deep abscess in the neck.

Rupture of the abscess in the throat may cause strangulation or aspiration in the lungs.

Other common complications are edema of the epiglottis, abscess of the pleurae and lung with resulting gangrene. Neglected cases may terminate as diaphragmatic abscesses.

Treatment. Surgery is always indicated in the treatment of retropharyngeal abscess.

In cases where the abscess can be seen through the mouth, drainage is instituted without any delay. In an adult with topical application of local anesthetic over the abscess a small incision should be made; when the pus is partly evacuated a pair of closed forceps is inserted to insure free drainage. Postoperatively the incision is kept open by means of the frequent use of a warm alkaline mouth-wash.

In children the management is different. General anesthesia should be induced by an expert and complete narcosis avoided. Either nitrous oxide or ethylene is satisfactory. We prefer an extreme modified Trendelenburg position, putting the head of the table way down. A wide exposure should be obtained with a mouth gag. Care is taken that the exposure does not interfere with respiration. A sharp incision is made and extended upwards for a distance of at least three-quarters of an inch. It is advisable to make the incision as close as possible to the midline from below upward. An aspirator is used to suction out the pus; the quantity withdrawn from what seemed a small abscess is often surprising. In our work we have used two aspirators; one held over the opening of the abscess and the other gently used in the throat to suction out any excess drainage. After the pus is evacuated the opening may be explored with a gloved finger to rule out any pockets. If the abscess is situated lower down, the upper part of the abscess is opened by strongly depressing the base of the tongue. A slight pressure below will drain the abscess freely. In one of our cases there was a small lateral abscess present having no communication with the central abscess. Possibility of a second abscess should be kept in mind.

After the operation the patient is turned on his stomach until thoroughly awakened from the anesthetic. We elevate the foot of the bed for a few days to promote better drainage. Aspiration

of pus in the lungs can always be prevented with this postoperative care.

An emergency tracheotomy for distortion of the larynx or trachea or edema of the epiglottis is sometimes necessary. Early diagnosis and treatment will avoid this operation.

The temperature usually does not become normal until the fourth or fifth postoperative day. Until septic absorption disappears the temperature continues; its persistence beyond the fifth day suggests some complication. Otitis media was the cause of continuation of high temperature in one of our cases; paracentesis of ear drum brought a successful recovery.

If there is a cervical extension of the abscess or the abscess is very low down, an incision in the posterior border of the sternocleidomastoid is most satisfactory. The external cervical route is also selected when the mouth of the patient cannot be sufficiently opened for incision.

In retropharyngeal abscess caused by tubercular osteomyelitis of the vertebra, an external incision is necessary. This incision is closed without drain after washing the cavity out with ether.

A retrosternocleidomastoid incision is most serviceable when an exploration is indicated.

The lateral pharyngeal abscess generally originates in the carotid lymph glands. The internal carotid artery is pushed inwards by the pus lying behind it. Pulsation can sometimes be felt in the wall of the pharynx. It is best to avoid incision through the mouth in cases of this type. An incision may be made along the anterior border of the sternocleidomastoid below the angle of the jaw. After the cervical fasciae are incised, by careful blunt dissection forward, inwards and upwards, the swelling can be approached and drained.

CASE REPORTS

Case 1. Man, twenty-four years of age, complained of coryza, sore throat and fever for five days. When I saw the patient he was in a semiconscious state. Marked swelling of the cervical glands was present. He had rapid pulse and difficulty in breathing. Temperature was 104.5 degrees. Patient had not swallowed water for the past thirty hours. It was impossible to get him to understand and cooperate. The mouth was held open with great difficulty. After the stringy mucus had been cleaned out a bulging in the posterior wall of the pharynx was noticed. The tonsils were reddened and covered by follicular exudate.

A small opening was made in the midline over the bulging posterior walls of the pharynx and a large amount of yellow, thick pus gushed out. The opening was enlarged with a pair of forceps.

Temperature dropped to normal on the fifth day. Patient made a satisfactory recovery.

Case 2. A male child four years old had suffered from a severe attack of croup. Diphtheria antitoxin was administered twelve hours previous by the attending physician without causing any improvement. Tracheotomy was considered and I was consulted. Rectal temperature was 105 degrees. Cyanosis and dyspnea were present. The cervical glands were swollen. The throat was examined with difficulty and a posterior pharyngeal wall swelling found. Fluctuation of this large swelling made the diagnosis very simple.

The abscess was drained under ethylene anesthesia. Breathing improved immediately after the operation.

The temperature dropped to normal on the fourth post-operative day and the patient made an excellent recovery. The throat culture was negative for diphtheria.

Case 3. Woman, thirty-two years old, had recurrent attacks of sore throat since the removal of her tonsils two years previously. Five days before examination she had contracted coryza and sore throat. Temperature was 103.2 degrees. Bilateral cervical adenopathy and some dysphagia were present.

Examination of the throat showed that there were pieces of tonsil tissue left bilaterally. There was a right superior paratonsillar abscess present. It was incised and drained. The temperature dropped to 100 degrees and there was noticeable improvement. On the fourth post-operative day the patient complained of dyspnea and dysphagia, and there was a great deal of pain in the enlarged glands of the neck. Her temperature had risen to 103.8 degrees. Inspection showed that a retropharyngeal abscess had developed since the previous operation. An incision made on the bulging posterior pharyngeal wall drained about three ounces of pus. No communication with the old paratonsillar abscess was present.

Temperature was normal on the fourth day; recovery excellent.

Case 4. Boy, four years of age, had been ill for eight days with bronchitis and sore throat. There was high fever from the very onset of the disease with rapid, painful enlargement of his left cervical glands. An incision in the middle of the sternocleidomastoid muscle was made by the attending physician. This did not reveal any pus but there was a great deal of bleeding from the depth of the wound, necessitating packing.

The patient was cyanotic with thready pulse and had dyspnea. Temperature was 105.6 rectally. The dressings in the neck were saturated with blood.

Throat examination revealed a large retropharyngeal abscess pushing the posterior pharyngeal wall forward and downward. It was drained through the mouth in the usual manner. It was necessary to remove the packing from the wound in the neck and ligate the severed ends of the external jugular vein. Temperature

became normal on the sixth day and recovery was satisfactory.

Case 5. Girl six years old was seen in consultation with Dr. M. R. Breck at the Ravenswood Hospital. Illness began with bronchitis three weeks ago. Temperature was 105.4 degrees. Glands in the neck were greatly swollen and tender. Leukocyte count 29,200, polymorphonuclears 83 per cent. Typical crowing respiration was present. Inspection revealed bulging abscess in the posterior pharyngeal wall. There was no tonsil tissue left in the throat. Under nitrous oxide and oxygen the abscess was incised through the mouth and a large amount of thick pus aspirated. There was a separate small lateral abscess present which was not connected with the main abscess. This was also incised. The temperature gradually dropped until the sixth day and then there was a rise to 104 degrees. A bulging left ear drum was discovered and a paracentesis done. Patient made a remarkable recovery. The pus contained staphylococcus, spirilli and few fusiform bacilli.

Case 6. A man fifty-eight years old was operated on by Dr. de Tarnowsky for left sided cellulitis of the neck following a severe attack of "flu." Patient very septic with a 105 degree temperature. Retrosternomastoid incision was made. Two ounces of pus drained from the deep seated abscess. The examining finger demonstrated that the abscess extended to the retropharyngeal space. Drainage continued for three weeks. Recovery.

Case 7. Man, thirty-five years old. Patient of Dr. W. K. Yeakel. Two months before admission to the Ravenswood Hospital had an attack of acute tonsilitis with enlargement of the left cervical glands. There was difficulty in swallowing during this attack. A physician made a small retrosternomastoid incision and drained a small amount of pus. The swelling persisted.

Examination shows that the old scar is healed but there is a large hard mass in the left side of the neck. No fluctuation present. Tonsils were submerged and the follicles were filled with small white spots. Fullness of the left lateral and posterior wall of the pharynx was observed. There was a temperature of 99 degrees. Leukocytes 13,000, polymorphonuclears 68 per cent., lymphocytes 32 per cent.

Dr. de Tarnowsky made a long incision in the posterior border of the sternomastoid muscle and exposed the mass. There was a great deal of adhesion present from the old operation. The mass was incised and large quantity of thick pus drained. The examining finger demonstrated that the cavity extended behind the pharynx and in front of the cervical vertebrae. The cavity was irrigated with ether and packed with iodoform gauze. No microorganisms could be isolated from the pus. The tonsils, subsequently removed by Dr. Yeakel, did not show any tubercle bacilli.

Comment. In the first five cases reported the diagnosis of retropharyngeal abscess was readily made. Simple drainage through the mouth gave satisfactory result. The last two cases were difficult to diagnose and required an exploratory retrosternocleidomastoid incision.

Case 6 probably had a cervical extension of a retropharyngeal abscess.

Case 7 suggested an abscess of tubercular origin. The history of a previous drainage and recurrence of abscess necessitated packing the cavity and letting it fill up by granulation.

Conclusions. Retropharyngeal abscess is not an uncommon condition; it may occur at any age.

Early diagnosis will prevent serious complications.

Treatment is always surgical and should be instituted immediately.

The proper avenue of approach will depend on the individual case.

PROSTATIC MASSAGE; FACTS AND FALLACIES*

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Massage is the oldest of all methods of treatment. In the history of medicine massage is mentioned in all epochs. It is referred to in the Chinese and Hindu records as far back as five thousand years B. C. Papyrus of Ebers describes various forms of massage used in 1500 B. C. Prostatic massage, however, is of comparatively recent date. It came into vogue at the close of the last century, being first introduced in 1892 by a Swedish masseur, Thure Brandt. In 1894 it was adopted by the Royal Institute of Massage of Stockholm and subsequently, it came into almost universal use both on the Continent and America. Prior to the general acceptance of this method, diseases of the prostate gland were treated by the applications to the perineum, of remedies in the form of contra-irritation, heat, cupping, leeches and the like.

Buschke and Langer,[1] the leading German urologists, in their Text-book on Gonorrhea state, that "Massage of the prostate gland per rectum is the primary point in the treatment of prostatitis, vesiculitis and ampulitis and that all other methods of treatment are merely adjuncts of the massage."

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Luys,[2] the French urologist, says: "Systematic treatment of prostatitis and vesiculitis, consisting of massage carefully, vigorously and systematically carried out, is simple and in most instances is followed by definite improvement." Janet,[3] who at the Fourth French Urologic Congress had strenuously opposed prostatic massage, in the later editions of his text-book recommends it, as a "necessary method of treatment."

However, others like Stutzin,[4] Hogge, Powez and Spinz[5] object to this method of treatment, as "unphysiological, unsurgical and dangerous." They claim that not infrequently it caused death by embolism, periprostatic phlegmon and generalized sepsis. Keyes[6] calls prostatic message an "unphysiologic attempt to empty prostate of secretions, which is often not nearly so beneficial, as a regular sexual intercourse would be, if permitted, were it not for social and hygienic obligations."

In view of such marked differences of opinion as to the rationale of prostatic massage, we are confronted with this question: Is it not a fact that the prostate is primarily a musculoglandular structure, and glands, being barriers of infection, are as a rule, not massaged for fear of generalizing the infective process? and, secondly: Is there any analogy to the prostatic massage in other fields of medicine, such as surgery, gynecology, etc.?

The opponents of prostatic massage rightfully say that no one would attempt to massage an inflamed tonsil, mammary gland, Bartholin or Skene's gland. And yet, in urologic practices, we massage also other glands, such as, Cowper's, Littré's, paraphrenal, etc.

Wherein, we may ask, lies the difference? Is prostatic massage only an exception that proves the rule? Or are there special theoretical considerations and practical justifications for this procedure?

A priori, prostates are chiefly massaged for chronic prostatitis. With this we all agree. We believe that chronic prostatistis, in about seventy-five to eighty per cent of all cases, is caused by chronic gonorrhea. Gonococci differ from other bacteria chiefly in that they have a tendency to localize in preformed lesions where they become encapsulated and form pseudoabscesses, which in the prostate are connected with prostatic ducts and may be evacuated on pressure into posterior urethra. It is only after mixed infection develops that the invading organisms involve interstitial tissue of the gland and real abscess formation ensues. Bacteriologic examination of the contents of the prostatic abscess usually discloses the presence of staphylococci, colon bacilli, streptococci, diptheroids, occasionally pneumococci, while gonococci are found in not more than ten per cent of cases.

On the other hand, let us briefly consider mastitis, the subject which usually serves as a favorite example for those opposed to the prostatic massage. We know, that the inflammation of the mammary gland is usually caused by the pyogenic organisms, which form real abscesses. Histologically, the mammary gland differs markedly from the prostate gland, because it is almost a homogeneous mass, without definite glandular organization and, with all its size, the mammary has only from fifteen to twenty excretory ducts, while the little prostate consists of about fifty definite glands, having almost as many separate ducts, each emptying on the floor of posterior urethra. On account of its anatomical location, the prostate gland cannot be subjected to as many therapeutic manipulations as the easily accessible mammary gland, and massage, therefore, offers one of the few available methods of treatment in prostatitis.

Stutzin and others further object to the prostatic massage on the grounds that: (a) massage attacks only one posterior surface and not the whole of the prostate gland. (b) Massage is useless in chronic prostatitis, in the treatment of which, as generally held, it is especially indicated, because here the pathologic process is not endocanicular or endoglandular, but always interstitial. (On this point, however, pathologists differ). (c) Anatomically, the prostate is an exceptionally finely branched tubulo-alveolar gland, with exceedingly narrow excretory passages and by means of massage, it is possible to express only a small part of prostatic secretion and not the whole of it. (d) By massage, the latent or chronic foci of infection in the prostate, vesicle or epididymis may become reactivated into acute processes and, finally; (e) Massage tends to generalize the local infection by the contiguity of structures or by the lymph or blood channels.

Years of observation and clinical experience have convinced me, that, if prostatic massage

does tend to generalize infection, this happens comparatively seldom and, invariably, as a result of faulty massage, either in the method or in time of its performance. In fact, we know that there is also danger in the introduction of ordinary urethral catheter, bougie, sound, cystoscope, or even intravenous injection, and yet, no one will condemn these therapeutic procedures, for this reason.

From the foregoing it is apparent that the rationale of prostatic massage is still a controversial subject and that its general adoption is based largely on therapeutic and empirical grounds. In the absence of clearly defined theoretical indications for prostatic massage, I submit the following practical considerations as the bases of its action.

1. Massage tends to remove plugs of mucus and pus, which occlude prostatic ducts and follicles. It is generally assumed that the action of prostatic massage in emptying these follicles is a direct one, that is, the finger directly expresses the accumulated contents of the gland. However, I believe, that the emptying is mainly accomplished by the contraction of muscle fibres surrounding follicles. The prostate gland is very rich in muscle fibres which are arragned circularly around the fundus and longitudinally near the ducts and thus are ideally disposed for emptyping of the gland. The fact that the muscle of the prostate is stimulated by massage is sometime shown clinically by the sudden hardening of the prostate that may be felt during massage.

2. Massage produces active hyperemia thus stimulating the reparative process by increasing blood and lymph supply to the gland. It causes an absorption of bacterial products by the blood stream, and drenches it with antigen, provoking a reaction, similar to that produced by the administration of vaccine. Clinically, this is often manifested by the presence of headache, fever and lassitude following the massage treatment.

3. Massage increases the muscle tonus of the gland. It is believed that the prostate acts as a powerful stimulant to the internal secretion of the testes, in which case the stimulating effect of massage should increase the activity of both the prostate and the testes, bringing a sense of well being and renewed vigor to men suffering of prostatism. Experiments of Serralach and Parés[7] seem to show that the prostate forms an internal secretion, which controls testicular function. They have demonstrated, that, in the dog, the bladder, ureter, vas and seminal vesicles are stimulated in vitro by the aqueous extract of mammalian prostate, including the human. It is reasonable to assume that similar contractions of homologous structures may be induced in man by the stimulation of internal secretion of the prostate.

We may say, therefore, that the objectives of prostatic massage, though not specific in character, consist mainly in the creation of more favorable local and general conditions for the healing powers of the organism to combat the disease entity known as prostatitis.

Let us briefly consider the forms of prostatic disease in the treatment of which, we believe, massage is indicated and necessary.

Massage is chiefly employed in the treatment of chronic prostatitis. Its use in acute forms is still a controversial subject. Wolbarst[8] makes a bold suggestion that the use of prostatic massage in case of acute anterior gonorrhea may prove of definite value in the prevention of the extension of inflammatory process to the prostate and vesicles. This procedure not only sounds a new and untried note in our treatment of gonorrhea in the male, but is diametrically opposed to the generally accepted dictum, that there is serious danger in any manipulation of the adnexa in the presence of acute gonorrhea. Wolbarst, however, believes that massage by its tonic effect and the resultant hyperemia, increases the power of the prostate to resist gonococcal infection. Besides, not infrequently acute urethral infection is grafted upon chronic or latent prostatitis and vesiculitis, thus indicating massage in the treatment of involved structures.

My personal opinion is that during acute stages of prostatitis and urethritis, massage should not be used. The prime therapeutic indications at the time are rest and watchful waiting to determine the progress of the disease, especially as to abscess formation, etc. After a lapse of time, when acute symptoms of inflammation have subsided, i.e., the temperature has become normal, pain, tenderness and tenesmus have lessened; when the gland no longer feels hot to touch and the tendency to abscess formation has passed, when, in short, the subacute stage has ensued, then a gentle and cautious massage may be instituted. Careful observation on whether the

massage improves or aggravates symptomatic conditions should be the basis for determination or whether to continue or stop the treatment. Any appearance of, or an increase in pain or other complications, is an indication for an indication for an immediate discontinuance of massage.

When we are dealing not with the primary or catarrhal form of prostatitis, but with follicular stage of the disease, i. e., when the inflammatory process has invaded deeper portions of the gland, and the accumulation of leucocitic infiltration and desquamated epithelium obstructed prostatic ducts and thus produced closed follicles, then a gentle massage may mobilize obstructing plugs and lead to their expulsion from the prostatic acini and ducts into the urethra. However, extreme care should be exercised in such cases, as the relatively thin basal membrane of the gland may rupture and allow pus to invade the periglandular tissues.

In diffuse prostatistis, with serous infiltration of connective tissue of the gland, with marked engorgement of the capillaries and with corresponding enlargement of the prostate, massage is definitely contraindicated for fear of abscess formation. The dividing line between acute diffuse prostatitis and the prostatic abscess is often very hard to draw. Some of the cases which we call acute prostatitis may be called by others prostatic abscess. Pathologically, acute diffuse prostatitis implies a marked infiltration of interstitial tissue with polymorphonuclear leucocytes, while abscess means a confluent suppuration involving some cavity formation. Clinically, we reserve to acute prostatitis, cases which "blow up" suddenly, with enlarged, congested prostate, usually, but not always, tender, from which we may easily express seropurulent or sanguineous material and which often subsides promptly on palliative treatment.

When abscess has developed, Lumb[9] and others attempt to rupture it per urethram by a gentle but firm massage before resorting to surgical drainage. This, I believe, is a very unsurgical procedure, presenting grave dangers of intra-abdominal rupture of prostatic abscesses, reports of which are occasionally found in the literature and on the post mortem table.[10] However, after prostatic abscess has ruptured per urethram, as it usually does, it may be advisable to institute systematic and gentle massage to facilitate its drainage and to hasten the reparative process of the gland.

In chronic prostatitis, massage is generally indicated in the treatment of all "soft" forms of this disease, i. e. when there is marked preponderance of exudative processes, lack of new connective tissue formation, in short, before sclerotic changes have developed. It is useful to massage a soft gland; it is, however, useless and often harmful to massage a hard gland.

To soft forms of chronic prostatitis belong the so-called "atonic prostate" with its large, flabby enlargement of the gland, a slight pressure on which usually brings a flow of clear fluid. This condition, in most cases, is induced by long repeated sexual irregularities and is manifested by prostorrhea, spermatorrhea, disturbances of normal function of erection, ejaculation, libido, etc. Prostatic massage here acts by causing hyperemia and possibly by the irritation of nervous tissue, with which the prostate is so richly supplied.

Some surgeons, especially in England, routinely massage the early or soft stages of prostatic hypertrophy, before indications for operative interference have developed. I have personally observed symptomatic improvement from massage of such prostates, which is due, I believe, to its beneficial effect upon passive congestion of the gland, usually present during the first stages of prostatic adenoma.

Diagnostic massage of prostate and vesicles and examination of expressed secretion is of vital importance in, (a) the determination of the cure of gonorrheal infection, (b) in eugenic tests and (c) establishment of metastatic foci of infection in various obscure diseases caused by toxic absorption. It is rather remarkable that so little attention has been given the prostate and vesicles as possible sites of infection, when other foci are so much in the limelight. From the examination of prostatic fluid we arbitrarily say that patients with less than five polymorphonuclear leucocytes per a high power field are considered pathologically negative, though there is no dividing line by the lecocytosis in prostatic discharge in normal and abnormal. Presence or absence of bacteria in prostatic secretion is of great importance, as sterile discharge, even if leucocytes are excessive, may not be called an inflammation, but congestion. Repeated microscopic examinations are essential, as one negative finding does not exclude prostatic pathology.

Stained smears, cultures and animal experimentations do not seem to be necessary to diagnose prostatitis, although further investigations along these lines are warranted.

Now, let us consider the mechanics of massage, namely, how to massage; (a) The position of the patient. I prefer the standing-stooped-over position, as a more convenient one for both the patient and the physician. Some massage in knee-chest, others, in Sims, the "squatting" position, etc.

(b) The direction of massage. In order to drain prostatic acini properly, pressure must be placed and directed in the manner of anatomical arrangement of the ducts. Experiments, however, have shown that excretory ducts of the prostate do not run in the same direction in all cases; that they often inter-cross and therefore, in order to empty them properly, it is necessary to massage in three different directions, viz., from the upper and outer border of the gland downward and inward, from the outer and lower border upward, and from the outer border towards the median line. All movements should be directed toward the median sulcus, where the deep urethra traverses the prostate gland. Especial attention should be given to the lateral borders of the gland, where infective processes are usually located.

Some clinicians, including Janet, recommend strong pressure at the end of massage upon the median sulcus in order to express the accumulated secretions. I do not believe in the advisability of massaging the prostatic urethra, as here are located the colliculus seminalis, verumontanum, orifices of ejaculatory ducts, etc.; massage may cause antiperistaltic movement of the ejaculatory ducts and lead to the resorption of expressed contents by the prostate, vesicles and epdidymis. I am of the opinion that acute vesiculitis, epididymitis and prostatitis often develop through inadvertent massage of prostatic urethra. Besides, any pressure upon the median sulcus of the prostate is frequently the only painful part of prostatic massage, which of itself may not be comfortable, but should never be painful.

Stripping of seminal vesicles should be a part of every prostatic massage, because in the light of our present knowledge, prostatitis may not be considered apart from vesiculitis, both conditions forming a single disease entity, that of prostato-vesiculitis.

Casper[11] long ago has postulated that (a) size and shape of prostates and vesicles may vary normally, as do facial features of people, and, (b) size of these organs is no guide to their pathology. Two lobes of the prostate are easily defined in health, while, if there is tenderness, swelling and loss of outlines of lateral lobes, an acute prostatitis is present. If one lobe is much larger than the other, probably the shrunken lobe has in the past been the site of an acute inflammation, which has been succeeded by fibrosis. The vesicles do not always occupy the oblique postion ascribed to them by the textbooks. They may be lying horizontally along and, for the most part, intimately in contact with the upper border of the prostate, so that it is very easy to mistake an induration of a vesicle for that of upper border of the prostate; but, as the treatment of the two conditions is practically the same, the error of diagnosis is not serious.[12]

(d) How hard to massage cannot be answered academically. At first, massage should be performed with extreme gentleness and caution till the patient's tolerance and reaction to this procedure are established, confining our manipulations to gentle stroking of each affected part. If only one part is involved, massage should be directed only to that portion. Not infrequently the patient at the first seance faints from prostatic massage, administered either too roughly or for too prolonged a period; though the syncope in such cases may be due more to psychic causes, such as fear of massage, than to the actual pain present.

At subsequent treatments we may massage more vigorously, the severity of manipulations may be increased to the point of the patient's endurance, being guided in that largely by the consistency of the gland. If the gland is soft throughout, massage should be gentle, if firm and indurated, more vigorous manipulations are indicated. Soft and hard spots on the surface of the prostate, if present, must be massaged accordingly. Always consider the results obtained. Massage of hard, angular, unyielding prostate, as stated before, should be avoided.

(e) How long should a prostatic massage last? In Vienna it is customary to massage a prostate from two to three minutes. In this country we massage less strenuously, about one minute, if the massage is gentle, and only six

to eight strokes in each direction if more vigorously performed. Massage should be repeated not oftener than every other day, or, still better, every third day or twice a week. If severe, longer intervals are better.

(f) How long should the massage be continued? In subacute cases, till pathological secretions cease or become physiological. In chronic cases, decision is more difficult and is to be based on one's experience and medical intuition. Theoretically, prostate and seminal vesicles should be massaged till the expressed discharge no longer yields pus. Practically, however, as Keyes[6] states it, "the most successful practitioners honor these rules more in the breach than in the observance." Many a prostate continue to excrete pus in spite of all that can be done by most vigorous and long continued massage. The prostate often shows less pus in the expressed secretion two or three months after massage is stopped. Over-treatment, in hopes of expressing the last pus cell from these organs, is to be avoided. When a patient under treatment by prostatic massage no longer shows any favorable reaction from it, especially if he begins to complain of vague pains, loss of normal libido, or is getting tired of it, then further treatment is objectionable. Prolonged massage of the prostate at times exercises pernicious influence on psychoneurotic patients, who often derive enjoyment in the act or may came to regard a regular repetition of it as essential to their life and health.

"It is the duty of the surgeon," says Hugh Young,[13] "to recognize these sexual neurotics and not to permit, in spite of their importunities, continuation of treatment which in the end is only going to make matters worse."

In general, it is advisable to give prostatic massage in courses of six to eight weeks' duration, with bi-weekly intervals of rest. Massaging should always be done on a full bladder. I usually request the patient to report for treatment with a full bladder, asking him to partly void in two glasses before massage. I examine the specimens, then massage and, after he empties his bladder, irrigate him by Janet method with some mild antiseptic solution. If rectal mucosa is too tender or too irritable to permit digital introduction, preliminary rectal douche or sitz bath will enable one after a few days to perform it. Mechanical devices for prostatic massage, the so-called Feleki's fingers, are satisfactorily employed by some clinicians, but their use by the inexperienced is not without danger.

As contra-indications for prostatic massage we should consider:

(a) Acute infections of the genito-urinary organs.

(b) Any febrile states.

(c) Hematuria, of any origin.

(d) When massage induces bacteruria, phosphaturia, or oxyluria, it is advisable to discontinue it, at least temporarily.

(e) Painful or bleeding hemorrhoids, rectal fissures, acute proctitis, periproctitis, colitis, etc.

(f) Tuberculosis, prostatic or vesical calculi.

(g) Malignancies of the genital tract.

(h) Cases recently operated on.

(i) Marked hypertension, hysteria or neurasthenia.

Conclusion—The facts set forth in this paper are not new, but they do need reiteration, to the end that we may become more conversant with this therapeutic procedure, which may prove invaluable, when properly used, without, at the same time, becoming over-enthusiastic about its merits by recognizing the dangers involved.

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TRAUMATIC RUPTURE OF THE SPLEEN*

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Rupture of the normal spleen is not as uncommon as most of us are led to believe. A search through the literature reveals that the organ is injured in about 30% of all abdominal injuries. In my own experience, the two cases which I shall discuss came on my service at the Edgewater Hospital within a period of four months. I am therefore making a plea to be on the lookout for rupture of this organ in all cases of abdominal injury. Many cases are recognized too late to do the patient much good, as the prognosis and mortality is directly dependent upon time elapsed between the injury and the operation. The cause of ruptured spleen may be divided into two groups, viz.:

1. *Spontaneous;* that is, conditions which render the spleen more friable, or increased in size, so that it is more liable to rupture, such as malaria, Banti's disease, tuberculosis, typhoid fever, etc., which will not be considered in this paper.

2. *Traumatic;* that is, injuries, such as accidents, automobiles or wagon wheels passing over body; or blows to abdomen, kicks of horses, falling on irregular objects, falling distances, railroad accidents, etc. The automobile is now our chief offender, and most cases are usually associated with one or more fractured ribs. This group can be divided into two groups; that is:

1. *Immediate,* in which the hemorrhage may be so copious as to cause sudden collapse and death before any steps can be taken to save the life of the patient.

In less severe cases a moderate hemorrhage develops in which all signs of internal hemorrhage is present, with a tendency to collapse; increasing pallor, and a clammy skin; feeling of suffocation; pain in the left side of abdomen and pain in left shoulder, with beginning dullness in flank.

2. *Delayed.* Thoses cases in which the signs of internal hemorrhage are not obvious for days or weeks. With different observers, cases have been reported with recovery in which the signs were delayed from 3½ to as long as 28 days.

According to Counsellor, the delayed hemorrhage may be grouped under three heads:

(a) Inter-splenic minor hemorrhage with secondary rupture of the spleen.

(b) Peri-splenic hematoma which may become encysted, suppurative, become organized or rupture into the peritoneal cavity, producing fatal hemorrhage.

(c) Continuous slow hemorrhage from the onset of the accident. The symptoms, as already mentioned, will depend on the severity of the case, whether the hemorrhage is copious, moderate or delayed. Essentially, there are signs of shock and internal hemorrhage. A similar classical picture may be observed in tears of the liver, kidney, pancreas or ruptured viscus, etc. However, the following symptoms and signs, following a history of injury, warrant the diagnosis of a ruptured spleen and should justify an exploratory operation.

1. Pain in upper left abdomen, often increasing in intensity.
2. Tenderness and muscular rigidity ~~over~~ lower chest and upper abdomen.
3. Some difficulty in breathing.
4. Pain referred to left chest and especially to left shoulder.
5. Signs of shock and internal hemorrhage, pale, ashen grey face, cold clammy skin; soft rapid pulse, although at first pulse may be slow; sub-normal temperature, later rises half to one degree; blood pressure low and within two hours a drop of 10 to 30 points, depending upon severity; red count declines from 4,500,000 to 2,500,000 or less; hemoglobin drops from 80-85 to 65 or less, depending upon severity of hemorrhage; white blood count usually high, 10,000 to 30,000; vomiting in about 21% of cases; abdominal distension usually in all cases. The diagnosis is made on the following points:
1. History of left sided trauma.
2. Pain in left chest and shoulder.
3. Difficulty in breathing.
4. Signs of internal hemorrhage and shock, cold clammy skin, soft rapid pulse, sub-normal temperature, etc.
5. Abdominal rigidity.
6. Increasing dullness in left upper quadrant.
7. Signs of external injury, although 22% may shown no evidence.

Ruptured spleen should always be suspected, especially in those cases which show no external

*Report of two operative cases with spinal anesthesia.

signs of injury but are in profound shock, with pain in left hypogastrium. In both of my cases there were no signs of internal injury, but the ashen grey pallor, out of all proportion to evidences of injury, with pain in the left hypogastrium, led to an early diagnosis of ruptured spleen, and proper treatment of shock and hemorrhage led to ultimate recovery.

The signs of hemorrhage may be delayed for several hours or days, and therefore should be remembered in the diagnosis, if one is on the look out for this condition in all cases of abdominal injury.

Mortality and *prognosis* depend upon the severity of injury, the extent of other organs injured, amount of blood lost, time of operation, facilities for blood transfusions, etc. Operative cases now have in general about 30% mortality. In splenic injuries without operation, it is 97%. When splenectomy is done, it varies from 20% to 40%, depending upon above factors. In War practice it was 50%.

Pathology. The rupture may vary from a slight rent to complete tearing of the spleen and its vessels—usually large blood clots fill the rent in the spleen with large blood clots under the diaphragm and around the liver. Blood clots irritating the diaphragm give rise to pain in left shoulder. The spleen or parts of spleen may be found anywhere in the abdomen. Rupture of spleen usually occurs when abdominal muscles are relaxed, thus receiving the full blunt of the blow. It is often associated with fracture of one or two ribs and with injury to other parts. A delayed hemorrhage may be due to a vessel that ruptures in the substance of the spleen, forming a sub-scapular hematoma and upon effort ruptures from the intra-capsular tension.

Treatment. The treatment is essentially surgical, either splenectomy, tampon or suture; combating of shock and hemorrhage which may be divided into two parts: 1. treatment of shock; 2. arrest of hemorrhage. The time element is important, as the prognosis is dependent upon the time between the injury and the surgical interference. Expectant and medical treatment is not advisable. Shock is treated by morphine, stimulants, warm blankets, salines or glucose and blood transfusions. The direct method is preferable and should be used before and after surgery in these cases, if possible. After combating immediate shock by above measures, one should not wait too long, but operate immediately.

Splenectomy is superior to suture or tampon and was our method of choice, although the individual case must be decided upon by the surgeon at the time of operation. For example, if there is only a small rent on the anterior surface of the spleen, a few small mattress sutures with or without a tampon may suffice. If, on the other hand, the rent is posterior or not easily accessible, or is extensive, a splenectomy is preferable. If the condition of the patient is critical and hemorrhage is severe, tampon or clamps may be advisable and after another transfusion giving the patient enough time to recover, so that later splenectomy can be done with less risk. But where condition permits, it is best to consider splenectomy immediately.

Anesthesia. Any of the anesthetics may be used—ether, gas or local. Most surgeons are now using local and ethylene gas. In both of our cases, spinal anesthesia was employed successfully. From my experience, I would say that it should be the anesthetic of choice in these cases. In the first place, the patients are too ill to have a thorough cleansing of the bowel; the abdomen is distended from the blood in the cavity and an associate ileus may be present. The spinal anesthesia enables the surgeon to deal readily with the bowel, which collapses after its use and renders exploration easier. The spleen is easily accessible without a great deal of trauma, which is a deciding factor in the recovery of these patients. The blood may be aspirated with a suction apparatus in preference to use of laps, packs and mopping. Then the blood can be citrated and used later if no doner is available.

In spite of the prevalent idea that spinal anesthesia is contra-indicated in surgical cases with low blood pressure, such was not the case in both of our cases. In one, before the spinal anesthesia was attempted, the blood pressure could not be obtained by the anesthetist; and in the other case, the systolic pressure was only 40 milligrams of mercury. In all of our cases of spinal anesthesia a preliminary ampule of 1 to 2 cc of ephedrin and novocain is injected subcutaneously at the site of puncture, which we believe has a sustaining effect on the blood pressure.

Results of Splenectomy. The exact function of the spleen is unknown, but this much is true:

it is not essential to life and other organs seem to take on some of its function. For example, statistics from autopsies show accessory spleens to be quite common, and where splenectomy has been done, accessory spleens have hypertrophied to almost the size of the normal spleen. There is also an enlargement of the lymphatic glands and the abdomen becomes studded with numerous small glandular nodules which are said to be characteristic of splenic tissue.

REPORT OF CASES

Case 1. A young white female, aged 11 years, was carried into Edgewater Hospital on August 13, 1931, by her father at 9 P. M. with the following history: The patient was playing on the roof of her home and fell about 10 feet to the ground, landing on her abdomen. She complained of pain in the abdomen and left shoulder and difficulty in breathing and faintness.

I had cared for the child repeatedly since infancy, but I had not seen her for about two years before her present admittance. I was immediately struck with the marked pallor of the child and inquired of her father if she was as pale before the accident as she was when I saw her. He stated she was always pale, but he thought she was much more so since the accident.

Physical Examination: There were no external signs of injury and the general examination was negative except for moderate tenderness over the left hypochondrium. Temperature 98, pulse 80, respirations 20. Roentgenograms of the left shoulder, humerus, ribs, pelvis, femur and lungs revealed no abnormalities.

Laboratory Findings: Urine was normal. Hemoglobin 80%; red blood count at 9 p. m. (time of admission) 3,900,000; white cell count, 6,250; 80% polymorphonuclear; lymphocytes 20%.

A tentative diagnosis of a ruptured spleeen was made and patient was kept in hospital for further observation and treatment. Seeing there was no evidence of fracture, we had considerable difficulty in convincing the father that the child should stay in the hospital. She was put to bed with ice bags to abdomen and warm blankets. By 1 a. m. the red count was 3,020,000; hemoglobin dropped to 75%; the white count rose to 10,200. By morning the red blood count was 2,850,000, hemoglobin 60% white count 12,600. The pulse rose from 80 on admission to 130 and the temperature from 98 to 99.6. By noon the respiration rose to 38. Patient vomited several times during the night; had a stool in the morning that contained no blood. The abdomen became distended and some dullness was present in left flank. Laparatomy was decided upon.

Patient was given 1000 cc. normal saline by hypodermoclysis and 1/6 grain of morphine. The father was found compatible for transfusion. Patient's blood pressure was 90 systolic, diastolic 60 on admission. By morning it was systolic 60 m—diastolic 40; before operation systolic was 40 mgm. The operation was started at 4 p. m. Patient given s. ephedrin and novocain at site of puncture using 100 mg. crystals for spinal anesthesia. A left upper rectus incision was made, and on opening the abdomen about 1500 cc. of dark blood and several large blood clots were removed. The spleen was located and presented a fairly deep laceration across the hilus with large blood clots in between the edges. I felt that the laceration was not extensive enough to do a splenectomy so I proceeded to place two mattress sutures across the laceration so that perfect hemostasis was obtained when they were drawn together. To further insure against secondary hemorrhage this was reinforced with a moderately sized pack and the abdomen was closed with a drain. The child was then given a transfusion of 500 cc. of blood by the Scannell method from her father and returned to her room, where she was given another 1000 cc. of fluid by protoclysis. The child made an uneventful recovery and was discharged August 28, remaining in hospital only fifteen days.

Case 2. E. M., a white girl 20 years of age, came on my service at the Edgewater Hospital on January 11, 1932, at 9:15 p. m. The history was of an automobile accident with the following complaints: Pain in left chest, left shoulder, feeling of suffocation, slight bruises and contusions about left thigh and leg.

Roentgenograms of spine, pelvis, chest and legs failed to reveal any signs of fracture.

Physical examination revealed a young lady of about stated age in state of shock; she was cold, clammy and her face was ashen grey. There was pain and tenderness over the abdomen, especially over the left hypochondrium and pain in left shoulder. Patient was put to bed for observation, as we suspected internal injury. Temperature was 97.8, pulse 88, respirations 20. She became nauseated and vomited several times during the night. Red blood count on admission, 3,370,000, hemoglobin 72% white count 20,000, polymorphonuclear 82%. By morning the red count was 2,750,000, hemoglobin 68%, white count 29,000, polymorphonclear 84%. Temperature rose from 97.8 on admittance to 99.4 degrees by morning. The pulse rose from 86 to 152. The abdomen became more distended and pain more marked in left shoulder. The pain in the abdomen was diffuse throughout, but more marked on left side, with beginning rigidity and dullness in left flank. Patient had difficulty in breathing (air hunger). A diagnosis was made of severe internal hemorrhage from ruptured spleen and immediate laparotomy was decided upon.

Patient was given morphine sulphate grains ¼ and 1000 cc. saline by hypodermoclysis. Her brother and sisters were grouped. A blood transfusion of 500 cc. of blood from her brother was performed before operation.

Under spinal anesthesia a left upper rectus incision was made. About 1700 cc. of blood and many clots were removed. The spleen was found and had several large deep lacerations extending down and through

the hilus that were actively bleeding. A clamp was quickly applied on the pedicle. The spleen was removed and doubly ligated with chromic catgut. Patient's condition appeared quite grave. She was given caffein sodium benzoate and digafolin on operating table. The abdomen was quickly closed without drainage. Another transfusion of 500 cc. of blood from sister was performed. The condition of the patient was greatly improved before leaving the operating room.

It is interesting to give the notations by our anesthetists who stated that the pulse was thready, very weak and hard to count, varying from 140 to 160 and that the blood pressure reading before operation could not be obtained. Physiological saline was given on her return to her room. On a liver diet and iron the patient made a rapid recovery and left the hospital on January 26, remaining only fifteen days. She returned every two weeks after leaving the hospital and appears to be in perfect health and shows no ill effects following the splenectomy.

Comment. It is interesting to note that both of these cases were females, one 11 and one 20 years of age. In spite of the fact that they were kept under close observation for internal injury, obvious signs of hemorrhage were not evident until about eight to ten hours after the injury. They were operated upon about fifteen hours after the injury under spinal anesthesia and recovered and left the hospital after fifteen days. In both instances the blood count and hemoglobin were normal on admission and dropped considerably after the first six hours. The white count was increased in both cases. The pulse rate increased from 83 on admittance to 140 during observation. The blood pressure was hardly obtainable at time of operation.

Conclusions

1. Ruptured spleen should be suspected in all cases of injury to abdomen, since it comprises 30% of all abdominal injuries.

2. The diagnosis is made essentially on the following points:

History of abdominal injury, signs of shock, signs of internal hemorrhage, pain in left hypochondrium, pain in left shouder, tendency towards rigidity, nausea, vomiting and dullness in flanks.

3. Increasing and persisting left upper abdominal pain following history of abdominal injury, with no external signs of injury, is highly presumptuous of ruptured spleen.

4. The treatment of the shock and hemorrhage is essentially by blood transfusion.

5. The treatment of the ruptured spleen is essentially surgical. After immediate laparotomy, splenectomy is the operation of choice.

6. Spinal anesthesia is a suitable anesthesia for these two types of cases; the spleen becomes easily accessible by the collapse of the bowel and exploration is much easier. A low blood pressure apparently is no contra-indication for spinal anesthesia in internal hemorrhage.

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GOITER IN PREGNANCY

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For our purpose we will divide this subject into three parts: pregnancy occurring in goiter, goiter occurring in pregnancy, and goiter following pregnancy. Of these the most important is the first, though its incidence is perhaps the least.

Persistent simple goiter of adolescence and simple goiter occurring after adolescence cause

very little disturbance in pregnancy. Occasionally these may become somewhat toxic, but may practically always be controlled. Pregnancy complicating toxic goiter, however, receives more careful consideration. To begin with, the incidence of pregnancy in hyperthyroidism is low; so low, in fact, that hyperthyroidism is often listed as one of the causes of relative sterility. This is probably due to the fact that there is a strong sympathetic hormone relationship existing between thyroid and ovarian function. Ovarian hypofunction is commonly associated with hyperthyroidism, and may thus render the woman with toxic goiter less fertile.

When pregnancy does occur in hyperthyroidism, the doctor usually experiences considerable anxiety due to extremely rapid pulse, weak spells, vomiting, apprehension and other symptoms of increasing thyrotoxicosis. Though it has been observed that occasionally the effect of pregnancy is a diminution of the toxicity, the usual outcome is an exaggeration of symptoms due to aggravation of the disease. Its effect may be so severe that continuation of the pregnancy becomes alarmingly dangerous—even fatal. In hyperthyroidism, therefore, pregnancy is a complication best avoided until such a time when the goiter has been cured either surgically or otherwise. So few recurrences result from pregnancy that it is not of serious enough consideration to condemn a cured goiter patient to future childless life.

In addition to the damage caused in hyperthyroidism by pregnancy, there may also be an interference in the progress of gestation by the goiter. In the exophthalmic types, particularly, spontaneous abortion and premature labor are common occurrences. There is no reason to believe, however, in case pregnancy is carried through, that the baby will be defective or otherwise handicapped in health or chance in life other than that produced by the effect of parental disturbance in its upbringing. These babies are quite as normal as others.

As to treatment, the simple goiters are usually amenable to small doses of thyroid substance or of iodine preparations. In all instances, rest and protection from worries and shocks, mental and physical, are of importance. The administration of thyroid substance or iodine in the more toxic types is a moot question, considered beneficial by some, and thought to be positively contraindicated by others. Surgery is often resorted to, and does not usually interfere with the pregnancy, though it is rendered more dangerous to the individual by her pregnant condition. In severe toxicosis the choice of procedure, whether operation, therapeutic abortion, or policy of conservatism, is largely a matter of judgment to suit the individual case. I cannot but believe that in any instance the result is problematical. Regardless of the plan adopted, satisfactory terminations are apt to be mingled with gross disappointments. In less severe conditions, certainly the conservative method of treatment is the course of choice.

During pregnancy thyroid enlargement is a very common occurrence. Most of these goiters are of a simple colloid type, and are non-toxic, being physiological phenomena which take place as a result of attempt on the part of the glands to meet the demand of excessive load thrown upon them by pregnancy. Toxic goiter may also develop during pregnancy. This happens too frequently to be considered incidental. But whether it is caused by the pregnancy or was potentially present and precipitated by the condition is not known, and is of negligible consideration. When goiter is suspected as a complication, careful supervision and medical management should be instituted. This type will nearly always respond sufficiently that the patient may be allowed to go to term and deliver spontaneously, interference in the second stage of labor being used to hasten delivery if warranted by cardiac symptoms. It is the opinion of the writer that all these cases should be treated conservatively. Should the symptoms be so grave as to be not amenable to such management, and the life of the patient felt to be endangered, then conservative surgery of the gland is preferred to abortion, as abortion at such a time is apt to precipitate a dangerous toxicosis.

In normal pregnancy there may often be symptoms such as vomiting, malaise, tremor of the hands and tachycardia; and the basal metabolic rate tends to increase, often becoming as high as plus 30% in the later months. Such symptoms alone should not lead to diagnosis of hyperthyroidism. On the other hand, hyperemesis may be the prominent feature of a hyperthyroidism the other symptoms of which may be masked. For this reason hyperemesis gravidarum should

not be diagnosed without first considering toxic goiter as the cause of vomiting.

Goiters incident to pregnancy often subside after term, but may persist, and must then receive the same consideration of goiters at large.

Thyrotoxicosis sometimes develops from one to six months after termination of pregnancy. This occurs with sufficient frequency to consider the condition an etiological factor of toxic goiter. Here again the treatment should be that accorded other goiters. Ovarian hypofunction following the puerperium may produce a syndrome of symptoms very closely simulating hyperthyroidism. Basal metabolism test is the deciding point of differentiation.

To sum up in conclusion, the following important considerations are noted:

1. Simple persistent adolescent goiter or simple goiter of adult life causes very little trouble in pregnancy, and should not be considered a contraindication to pregnancy.

2. The incidence of pregnancy in hyperthyroidism is low, but is dangerous, and should be avoided.

3. Thyrotoxicosis in a cured patient seldom recurs as a result of pregnancy, and the fact that the condition once existed should not contraindicate future child-bearing.

4. Spontaneous abortion and premature labor frequently occur in Graves' Disease.

5. The babies born to mothers with toxic goiters begin life quite as normally as other infants.

6. Simple goiter, whether existing before pregnancy or occurring after that condition is instituted, is quite amenable to small doses of thyroid substance or iodine preparations.

7. All milder forms of toxic goiter in pregnancy should be treated conservatively, and the pregnancy carried to term.

8. In the event of surgical interference, conservative thyroid surgery is preferred to abortion, as the risk to life is less, and as the pregnancy often remains undisturbed.

9. Pregnancy may be considered the etiological factor of hyperthyroidism occurring either during gestation or after term. In the former instance the goiter often returns to normal after pregnancy is over. Goiter present after the puerperium should be handled as any other goiter.

10. Mild symptoms during pregnancy and elevation of basal metabolism in the later months to not over plus 30% should not be classified as hyperthyroidism.

11. Hyperemesis gravidarum should not be diagnosed without hyperthyroidism being first ruled out.

12. Hyoovarianism following pregnancy may very closely simulate hyperthyroidism, and must be differentiated from it.

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CONSIDERATION OF URETERAL CALCULI*

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The relative frequency of ureteral calculi places them in a position of diagnostic importance not only to the surgeon but to the internist. The diagnosis and removal of ureteral calculi by means of cystoscopy and ureteral manipulation approximate the art of the accoucheur.

Calculi may be divided into two classes: *Primary,* known as uric acid, xanthin, cystin and calcium oxalate, and composed of substances found in the urine; *secondary* calculi, which are associated with urinary stasis and infection. Primary calculi are uncommon and may occur in a urinary tract showing no evidence of disease. Their etiology is obscure. Secondary calculi are common. A careful consideration of the factors of urinary stasis and infection will suggest prophylactic measures in stone prevention.

In the presence of urinary toxins, bacterial or otherwise, the pelvic and ureteral muscles become damaged and atonic. Normal peristalsis is interrupted, and there occurs a condition of urinary stasis or stagnation. Very frequently, there may also exist an actual narrowing of a ureteral segment, the result of previous periureteritis or secondary to contiguous pathology such as vesiculitis or salpingitis. A condition of urinary stasis when once established offers a fertile field for the incubation of organisms. Further im-

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pairment of function results with more marked renal secretory changes, especially that of acids. Staphylococci, B. coli, and streptococci are frequent invaders and may reach the field through contiguous tissue, or more often by means of the blood stream from foci of infection and influenza. Rovsing was the first to express the opinion that an urea-splitting strain of organisms was the most frequent cause of recurrent calculi. Later other investigators isolated urea-splitting strains of staphylococci and B. coli. In the presence of such stasis and bacterial action, a detached piece of epithelium or foreign body may readily become a nucleus for the deposit of urinary salts. The center of such calculi contain viable bacteria. Perhaps the ability of some strains of bacteria to split urea influenced the results of animal experiments carried out by Rosenow and Neisser, in which a strain of green streptococci isolated from the urine of a lithiasis patient, was sealed in the dental root canals of six dogs. Five of the dogs developed urinary calculi.

About ten years ago there occurred an epidemic of urinary calculi among animals, principally sheep, at the Animal Experiment Station of Iowa State College. The mortality rate was high. An exhaustive study disclosed the probable cause to have been an epidemic of upper respiratory tract infection some months before affecting the same animals.

The ureter is not the site of calculous formation in most instances, but rather the passageway. Practically considered, ureters are hollow muscular tubes, about 30 cm. in length, connecting the renal pelves with the bladder. A ureter is about the size of a quill, varying between 0.2 and 1 cm. in diameter due to three or four anatomical narrowings. Structurally, the ureter is composed of an epithelial lining free from glands but rich in nerve supply. The muscular wall is composed of three layers which are surrounded intimately by plexuses of nerve filaments derived from the vagus and celiac axis. Here also are blood vessels. These in turn are surrounded by an outer fibrous sheath. Possessing such a structure, the ureter is afforded the property of peristalsis which is synchronous with the contracture of the renal calices and pelvis, and serves to propel the urine to the bladder.

Any interference with the peristaltic flow of urine or any irritation of the tract provokes symptoms in proportion to the impairment. The symptoms are usually of four types:

1. Ureteral colic due to hyperperistalsis. The pain is colicky, severe and radiates to the groin, thigh or genitalia.

2. Renal tension pain due to back pressure of urine, the result of obstruction or block. This type of pain is dull and very often associated with, but overshadowed by a ureteral colic. Renal tension pain often persists between ureteral colics and is made severe by first percussion over the kidney area posteriorly.

3. Urinary sepsis due to bacterial action and toxic absorption. In this instance the symptoms are mostly general.

4. Reflex, affecting the gastro-intestinal tract.

Ureteral colic and renal tension pain are not easily confused with other disease. Urinary sepsis may exist in the absence of other symptoms and varies in degree depending upon ureteral drainage.

Reflex symptoms suggesting gastric or duodenal ulcer, appendicitis or colitis may mask the diagnosis in the absence of colic or renal tension pain. It is not unusual for the roentgenologist to find an unsuspected ureteral calculus shadow during a gastro-intestinal series. Symptomatically, a calculus in the ureter may simulate an acute abdominal crisis.

Calculi not only interfere with the flow of urine, but irritate the ureteral mucosa and therefore may cause any or all of the above symptoms. Occasionally there is a marked hematuria due to mucosal laceration.

The diagnosis of ureteral calculus cannot always be made roentgenologically, many stones, even large ones, failing to cast a shadow.

When a diagnosis of ureteral calculus is made, additional information is necessary in order to determine the location, size, position and consistency before inducing "stone labor." One must consider the age, the general condition of the patient, and also the urinary function of the *afflicted* and the *opposite* side.

If a calculus is more than 1 cm. in diameter, and especially if it is high in the ureter, a ureterotomy is usually indicated. An ureterotomy is not a serious operation in such an instance, and saves the patient a drawn out "stone labor." This applies particularly to the aged, infected, and those with poor renal function. However, if the calculus has shown a tendency to descend,

as in most cases, and a urological survey shows no impending danger to either kidney, watchful expectancy with repeated roentgenological check-up is in order. This applies to small stones or to recurrent stones in dilated ureters. Intravenous urography is often a valuable aid in estimating renal damage.

Many of the delivery problems of the urologist are similar to those of the accoucheur. Some of the obstetrical terms are descriptive. For instance. "passenger," "passage" and "powers" may represent the stone, the ureter, and the peristaltic power of the ureteral contractions, plus the very important hydrostatic pressure of the retained urine. If a patient in "stone labor" reaches an impasse, or if the pain is acute, an ureteral catheter passed alongside the stone may perform a version and permit the stone to descend by a smaller diameter. If the catheter is allowed to remain in situ, the ureter and pelvis drains, and the patient is given a respite. At times several catheters or bougies are passed by or to the stone to encourage ureteral dilatation. Frequently ureteral calculi are grooved or eroded, thus permitting a moderate flow of urine alongside. In such instances the symptoms are not acute, and "stone labor" may be induced by ureteral manipulations.

There are numerous methods in vogue to assist in the transureteral delivery of a calculus. Each case is individual, and the urologist has advantageously borrowed heavily from the art and mechanics of obstetrics in devising instruments and applying them. In general, to be successful, an instrument must produce a dilatation of the passage to accommodate the passenger. Instruments designed to ensnare or seize the stone have not been generally adopted.

If the ureteral orifice is very small, a ureterotomy should be done. In some instances, where the calculus is near the orifice and there exists considerable edema, light fulguration opens the tissue sufficiently to allow the edema to recede. Fulguration about the ureteral orifice must be performed with care, to avoid the formation of a cicatrix.

Demourskin has designed a rubber bag attached to a ureteral catheter that may be placed and distended immediately below a calculus in the ureter. He has also designed grooved sounds for the progressive dilatation of the lower ureter and reports favorable results with their use.

Lespinasse was one of the first to use laminaria or sea tangle in the ureter. He corked the ureteral orifice with a pellet of sea tangle, and allowed the obstruction to remain several days. His object was to dilate the ureter by hydrostasis, and thus permit descent of the calculus. This procedure had the disadvantage of being painful, long drawn out, and of producing occasionally unfortunate results during the removal of the pellet.

The Chevassu instrument combined a ureteral catheter with a segment of sea tangle. The early instruments of this design met with disfavor, due to the tendency of the sea tangle to remain in the ureter.

During the past year, ureteral bougies composed entirely of a selected sea tangle have proved successful in the author's experience. When indicated, they offer a means whereby the ureter may be gradually and gently dilated below a calculus, and include the ureteral orifice. In the presence of fluid, the bougie becomes flexible and mucilaginous, at which time it may be readily passed through a cystoscope and into the ureter. A No. 6 F. sea tangle bougie expands to No. 12 F. when allowed to remain in the ureter for several hours. There is a minimum of ureteral trauma, for the bougie requires but one placement. Following the placement and the removal of the cystoscope, an end of the bougie is permitted to project from the urethral meatus, so that it may be withdrawn later by simple traction. Upon removal, the expanded portion becomes an index of the ureteral dilatation. This dilatation persists for some time, as manifested by the gaping ureterai orifice. If there is no contraindication, the patient may exercise immediately following the removal in an effort to apply hydrostatic pressure and spontaneous delivery into the bladder. This exercise is similar to that performed in jumping rope.

In the preparation of this paper many details and data relative to the urinary tract and lithiasis were omitted in order to more briefly correlate certain pertinent facts that may be of aid in the recognition, management and treatment of ureteral calculi. The subjects of bilateral ureteral calculi and calculi in the one remaining ureter, together with unusual and freakish types, have been omitted purposely.

In conclusion, the following statements seem worthy of emphasis.

1. Urinary stasis and infection are important causative factors in urinary lithiasis.

2. Atypical symptoms may simulate those of the intestinal tract.

3. Soft calculi may not throw a roentgenographic shadow, and urinalysis may be negative or of little diagnostic value.

4. Most ureteral calculi that travel into the lower one-third of the ureter are amenable to cystoscopic instrumentation and delivery.

5. Surgical interference should not be postponed when there are definite symptoms of ureteral block, especially when the calculus is in the upper ureter and pelvic drainage impossible through a retention ureteral catheter. The general condition, age of the patient, size and location of the calculus are very important in formulating a decision. It is often easier on the patient to have a ureterotomy than a repetition of futile attempts at cystoscopic delivery.

6. A patient having passed or having been delivered of a ureteral calculus has not been completely treated until urinary stasis and focal infection have been eliminated. This responsibility should be shared alike by the physician and the urologist.

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DISCUSSION

Dr. Budd C. Corbus: Dr. Fillis is to be congratulated on this very interesting resumé of an important subject. With regard to pain, we are all prone to give morphine for renal colic. Morphine contracts non-striated muscles, but the stone does not make any progress. If we bear this in mind we would prescribe something that would relax the muscles. The sea tangle which Dr. Fillis mentions has apparently given good results.

The ureter is one of the most delicate organs of the body, and this should not be forgotten in treatment. The procedure of splitting the ureter and allowing nature to take its course is also in order. The old time surgeon operated on the ureter and took out the stone, or on the kidney and took out the stone, and the patient soon returned. As Dr. Fillis says, free drainage must be established.

Dr. J. E. Sanner: I was glad that Dr. Fillis emphasized that ureteral and renal calculi may make their appearance first with symptoms of gastro-intestinal disorders in many cases. Many laparotomies could be avoided if this were borne in mind, the real cause of the patient's illness discovered and eliminated.

RELATION OF THE RECTUM TO THE MANAGEMENT OF COLON DISEASES

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The treatment of the rectum in the management of colon diseases occupies an important place in the practice of the proctologist. There exists a physiological relationship between the rectum and the lower bowel that necessitates recognition and treatment of any rectal disorder to insure, and in some cases, to effect a cure of some colon abnormality. This is particularly true in the so-called "colitis." A recent artitcle by P. W. Brown, and articles[1-2] by others, emphasizes how the "toxic," "mucous," or "spastic" colitis is in truth a dysfunctioning colon, and not a true colitis. This particular type of colitis occupies the largest group of colon disorders. The treatment of this type requires not only the usual colon management, but frequently requires rectal treatment to obtain the best end results, or to effect a normal colon function.

That a relationship does exist has been a matter of previous publications.[3-7] That such a relationship exists with a diseased rectum as a cause for a dysfunctioning colon has not been recognized sufficiently to interpret properly the particular group to which this class belongs. Certain cases may remain in the category of a true colitis or infection, and are not primarily of rectal origin. Other cases, manifestly ulcerated or infected, are merely benefited, if at all, by rectal treatment. It is the purpose of this paper to show how rectal treatment in certain cases is necessary for the proper management of the various types of colon diseases, particularly in the dysfunctioning colon, and to attempt to show why and how that relationship exists.

The Abnormally Functioning Colon.—A large number of the rectal cases that are seen in the office, on careful history give symptoms which if more pronounced could be interpreted as those of a dysfunctioning bowel, or the so-called "colitis." Many cases on the other hand are accompanied by severe symptoms significant of the abnormally functioning bowel.

The relationship that exists is further accentuated in a study of the symptoms produced by a rectal irritation as when caused by an opera-

tive procedure, or by a simple injection treatment. By such a procedure we are as definitely demonstrating the origin of this type of colitis as by any set experimental method. A review of various case histories shows that during a post-operative rectal convalescence, or following a medical injection, the following symptoms may arise:

1. An increased frequency of bowel movements may occur that are loose, soft, or watery, and that may be accompanied by the passage of considerable mucus.

2. Gaseous or cramping discomfort in any or all parts of the lower abdomen, purely colonic, may occur in typical fashion, that may be periodic, or constant, and may precede or follow a bowel movement.

3. Reflex gastro-intestinal symptoms may accompany the colon disturbance.

4. A previously deranged colon invariably becomes more abnormal, even to the point of thoroughly incapacitating the patient well on the road to convalescence.

5. Local discomfort always is accompanied by an increased difficulty in the passage of bowel movements, by pain of a transitory nature, by a feeling of protrusion, and often by gaseous discomfort.

6. Referred pain of rectal origin, indicative of the reflex disturbance provoked by a rectal irritation, has been observed in the lower back, down the legs or thighs, even to the ankles, or in the scrotum, penis, coccyx, or bladder. The frequency of the latter symptoms from a rectal reflex deserve more mention but they are not pertinent to the subject under discussion. The treatment in such cases often may be for the symptoms rather than for the cause.

Symptoms of the irritable or spastic bowel so produced may be explained in part as due to a reflex conveyed through the lumbosacral plexus, but in addition it is more than a possibility that the rectum besides being a focus of infection for disease other than colonic,[8-12] provokes a colitis or disrupts a normal colon by its disease. Certainly where virulent organisms predominate, any lesion suggests either a potential or an exciting cause for an existing disease of an infectious nature.

The Pathological Anatomy of the Anorectal Region.—The peculiarity of the nervous innervation of the anorectal region might explain the lack of recognition of the rectum as such a focus. Again the infrequent use of the sigmoidoscope and the anoscope or the failure to interpret definite disease, may in part be responsible.

Rectal symptoms may be lacking or symptoms of minor import to the patient. Such as a slight itching, a mild discomfort, or merely blood streaks, suggestive of mild hemorrhoids alone, may be present, and yet the infection may be marked. The pectinate line or dentate margin divides the sensory from the asensory zone. To become painfully or rectally sensible, infection and inflammation must extend externally. Though recognized, if proctoscoped at the time of the onset, characteristically the infection becomes diffuse, and may be non-palpable or but barely palpable. Throughout its course the infection may never be visible externally. Thus a cryptitis may result in a papilla and give no further symptoms; an abscess may remain entirely perirectal and drain out of its cryptic opening to become a small internal sinus, and yet harbor pus pockets nevertheless. Even without any accompanying localized pus accumulation, certain rectal diseases should be considered as infective and should be treated as of importance. Hemorrhoids are the most neglected as well as the most common offender of this type of infection. Periodically they become inflamed and diffusely infected, often being accompanied by cryptic pus plugs, yet giving only slight inconvenience to the patient. That they may result from trauma on a mechanical basis is true; but that a large number result as a perivascular infection undoubtedly also is true. That formation alone would therefore signify their importance as foci of infection in themselves. I am firmly convinced that hemorrhoids frequently are the precipitating cause for a more serious anorectal disease, and that hemorrhoids alone without any other accompanying anorectal pathology are most frequently the cause for many cases of an abnormally functioning colon in the so-called "colitis."

The Rectal Treatment in the Abnormally Functioning Colon.—The treatment of the rectum in spastic colitis, or mucous colitis, or an abnormally functioning colon, may or may not in itself relieve such a condition. It usually is an aid at least. The important point is that in

a large group of abnormal bowel conditions, not infrequently the treatment results in a complete subsidence of all symptoms whatsoever. To obtain such an end result, however, necessitates for the time being at least, the observance of all other factors entering into the picture, all of which play a part. Thus it is necessary to use as coadjuncts, diet, medication, and to maintain proper elimination by proper habits and instructions. It is important likewise to appreciate that the removal of any accompanying rectal pathology may not be the removal of the cause. An abnormally functioning bowel may result without question from upper gastro-intestinal abnormality, from a pelvic or intra-abdominal pathology, from extrinsic tumor masses, from nervous instability, neurosis, debility and many other sources too numerous to mention. But there is a group that is primarily rectal and remains as such regardless of treatment, unless the rectal pathology is removed. To remove the pathology partially, as is the general practice, does not suffice, but to remove it thoroughly and completely as with the Buie technique, which is not the usual practice, gives results in this group which are lasting and permit of no rectal recurrences save in the most exceptional instances. No continuance of diet or medication is necessary once the rectum is again a normally functioning organ; that is when the wound is thoroughly healed and the tissue changes completely resolved, or in certain selected cases where non-surgical treatment is indicated, and the diseased condition has subsided sufficiently again to allow the normal rectal function.

Presented in brief the following histories, which are only a few of a very large group, would signify the relationship in the abnormally functioning bowel and a rectal disorder or infection:

Mr. H. A. S. aged 39 years, Jewish; occupation, company manager. This patient was seen elsewhere in April, 1929, for gastric symptoms. He was told his symptoms were due to a "nervous stomach and nervous indigestion," and was given a diet which he states was given for this and low blood pressure. He returned in November, 1930, for added symptoms which were diffuse gaseous distention, particularly across the lower abdomen, a distress that was relieved by bowel movements. The bowel movements were hard, black and fragmentary, and the initial movement was explosive in character. He was intermittently constipated, at which time a sacroiliac and lower lumbar backache would occur. He used no catharsis, but he did use an enema, one or two times weekly. In addition he complained of a perianal itching that had commenced in August, 1930, and periodically was severe enough to keep him awake at night. His diagnosis elsewhere was pruritus ani, and irritable colon. Local measures were used to the rectum with partial relief. Dietary measures were used that gave only partial relief to his intestinal complaints, viz., bland diet, regularity of habits, and agar agar daily, etc.

He first came to my office January 23, 1931, with a four-day history of pain that was perianal, and an abscess that had ruptured spontaneously on the day of his examination with a discharge of pus and blood, and consequent relief from pain. His other symptoms continued as stated.

A diagnosis was made of fistula-in-ano, mild hemorrhoids, and kraurosis ani. The general examination was essentially negative. Operation was advised with the added hope not only of relieving him of his rectal disorder, but also of ridding him permanently of his abnormally functioning bowel.

Operation was performed February 3, 1931, at the Evanston Hospital. The fistulous tract, the hemorrhoids, and the diseased kraurotic skin were removed, and the mucous membrane was brought into place at the proper level of the dentate margin. March 11, 1931, the wound was practically healed, the bowel movements were normal in every respect, with no medication or diet other than a general well balanced one. Seen on May 18, 1931, his condition was found normal, and the patient has since continued to be free from all of his former symptoms. He described his bowel movements as being fully formed, spontaneous and complete, occurring one time daily.

Dr. M. H. P. Aged 42 years, female; occupation, physician.

A previous hemorrhoidectomy was done elsewhere 10 years ago. An anal dilatation September, 1929, was also done elsewhere for "hemorrhoids," which followed rather severe constipation in the Summer, 1929. Symptoms of pain, blood, streaks, mild itching, and post-operative tags had been present since August, 1929. Symptoms of colitis had been severe and periodically had incapacitated the patient from her duties as a physician since September, 1929. She was seen in February, 1930. A sigmoidoscopic and proctoscopic examination showed large prolapsing papillae each 2 c. m. in size, edematous tags, mild internal hemorrhoids, and severe anal spasm. An operation relieved the severe bowel and rectal symptoms immediately, but an occasional slight gaseous discomfort periodically was present in the abdomen, which peculiarly accompanied an infrequent congestion and thickening of the nasal mucosa. The B.M.R. showed a rate of minus 12. Thyroid extract given in ½ grain daily doses entirely relieved both nasal and the very slight remaining colonic irritation.

Mr. R. W. C. Aged 53 years; occupation, company manager. After an extensive and thorough work-up in a Chicago Hospital, this patient was referred for

rectal treatment. He was being treated for the main part by a bland diet, bismuth powders, and agar agar for frequent attacks of abdominal distress, gaseous in character, transient belching, heartburn, etc. He had been diagnosed in view of his symptoms and findings as diverticulosis and spastic colitis. His symptoms were not relieved by these measures.

The rectal symptoms had been present three to four years, characterized by periodic pain following bowel movements and perianal itching of a mild degree. His abdominal cramps had been present an equal length of time.

The proctoscopic findings were severe anal spasm with pain, partially healed fissure, and hemorrhoids.

The patient refused operation which was advised, and carried on with a long drawn out medical course of injection treatment. Treatment commenced, April, 1931. Throughout his course of treatment, and to date, he has remained absolutely symptom free, except that immediately following each injection treatment he was apt to have some bowel distress.

Miss A. G. Aged 22 years; occupation, home girl. Complained of alternating constipation and diarrhea. The diarrhea occurred every few months and lasted usually about two days. She had been constipated over a period of years. Her diarrhea and abdominal symptoms were present only several months. The usual symptoms accompanied. Hemorrhoids had been present four to five years, periodically painful with bowel movements and bleeding on one former occasion. There was an occasional protrusion that required no replacement.

The examination revealed a spastic colon, and in addition mild prolapsing internal hemorrhoids, mild external hemorrhoids, prominent crypts, anal spasm, and evident infection in the hemorrhoidal zone. Her mother had suffered a rectal tragedy in previous years that left her incapacitated. Her father was a physician. This combination of circumstances coupled with the assertion that her "colitis" might be benefited by an operative procedure resulted in a consent on their part to submit to operation even though the hemorrhoids were mild and of the type that usually is treated symptomatically and regarded as insignificant.

An operation resulted in a severe flare-up of the colon with continued severe abdominal cramping pains, diarrhea, loss of appetite, etc., and resulted in the patient remaining bedridden for many days when ordinarily one is comfortable and ambulatory.

Operation was performed July 7, 1931. Since September 11, 1931, however, the patient has remained practically symptom free and is now eating normally and having normal and regular bowel movements.

Mr. O. H. Aged 27 years; occupation, gardener. Seen elsewhere, February, 1931, where irritable colon was diagnosed and a suspicion of amebic dysentery prompted a course of stovarsol and emetin which was repeated on his return to his home physician. There was no change in his symptoms in spite of a careful bland dietary regime.

He was seen in my office August 25, 1931, complaining of an increase in the severity of his symptoms. In brief he stated that for 1½ years he had had an increased number of bowel movements accompanied by a gaseous discomfort preceding the movement. The bowel movements were fragmentary or soft and mushy, were accompanied by the passage of mucus, and varied from four to eight in number. Blood had first been noticed 6 months previous to the initial examination, and streaks had been noted occasionally since with his bowel movements. His appetite had been good until shortly before his initial examination when his symptoms became worse, so that in addition he complained of heart burn, occasional belching, particularly when hungry, and occasional eructation of food, not accompanied by nausea.

Nervousness and the loss of 20 lbs. in weight during the past 1½ years was complained of.

The sigmoidoscopic examination showed redundant hemorrhoids, considerable mucus, a healed indurated 1.5 c.m. valve ulcer, cause unknown, and an erythema of the mucosa. A biopsy of the valve ulcer, and examination of the mucus, feces, and in addition, two stool examinations, were entirely negative.

He was carried under observation for two weeks, care being taken to see that he followed a carefully worked out bland diet and bismuth subcarbonate, and an agar regime. The result was negligible.

Hemorrhoidectomy was performed September 3, 1931. One week following he was symptom free and having but one well formed and complete bowel movement daily. His wound at the present time is healed, his diet general, bowel movements regular and he remains entirely symptom free.

The Relationship of the Rectum to Chronic Ulcerative Colitis. It is a generally accepted fact that chronic ulcerative colitis is an ascending type of disease. Whereas certain cases are regional, the rectum is primarily for the most part affected.

Certain chronic ulcerative colitis cases would signify not only that the origin of this disease is rectal in most instances, but that the primary origin is anorectal.

1. The histories in three cases were that a fistulectomy with preceding abscess, etc., preceded the acute ascending ulcerations.

2. Anal soreness was an early symptom in several chronic ulcerative colitis cases, but may have been due merely to the rectal ulcerations.

3. Two post-operative hemorrhoidectomies gave findings postoperatively that might indicate a chronic ulcerative colitis in the bud. Both cases showed a thin anal ring of persistent granular tissue that bled on cotton swabbing and was entirely separate from the healed post-operative wound. One case pre-operatively showed rectal

lymphangitis. The other pre-operatively was a faulty Whitehead operation.

4. Associated or residual anal pathology was frequently present in the arrested or healed chronic ulcerative colitis.

5. A superimposed Bargen gram positive diplococcus infection was seen in a few cases of rectal or rectal and sigmoid disease where the primary pathology was clearly not a chronic ulcerative colitis.

The Rectal Treatment in Chronic Ulcerative Colitis. The associated or residual anorectal pathology that frequently accompanies a chronic ulcerative colitis is not only significant as a possible "feeder" to the ulcerative colitis, a source of infection and discomfort to the patient, a possible source of origin of the disease, and an undesirable complication, but it is of importance in the discussion because the care in rectal management in all cases of chronic ulcerative colitis, demands considerable care to avoid undesirable complications.

Surgery not only of the rectum but of the intra-abdominal organs and elsewhere is contra-indicated in an *active chronic* ulcerative colitis as stressed by Bargen himself. The disease so highly infective, in addition to resulting in a draining sloughing infected wound or general sepsis, is also characterized by a markedly lowered resistance on the part of the patient, which hand in hand with the virulence of the infection results disastrously or fatally to the patient. Ileocolostomy, ileostomy, or rectal surgery are therefore to be avoided except where other measures fail or exceptional circumstances demand such procedures.

Rectal surgery after the subsidence or entire healing of chronic ulcerative colitis, may be most urgently indicated, particularly if it is to be surmised that the anorectal disease might in itself be responsible for a recurrence so common to the disease.

It was my pleasure to have as a visitor, Dr. Curtice Rosser of Dallas, Texas, who was inclined to believe that this possibility was more than a mere surmise. Dr. Rosser saw two cases of chronic ulcerative colitis while visiting with me in Chicago and Evanston. Both of these cases had much in common that would indicate the necessity for rectal intervention. One was a healed chronic ulcerative colitis that was post-operative following the removal of a small polypoid area in the lower rectum and an excision and repair of an anal sinus and sphincter abscess. The other was a case of seven years standing that was receiving an autogenous diplococcus vaccine for the first time with very beneficial results, but which came to the clinic primarily because of discomfort from two anal sinuses. The first case mentioned had a mild-flare-up of her ulcerative colitis immediately following the operative interference, but responded quickly to vaccine therapy, and within a very few weeks became symptom free again. The other case, after complete or nearly complete healing, should also have an operative procedure among other things to insure complete healing and freedom from rectal discomfort.

Other cases could be mentioned but these are illustrative of the need for rectal treatment in the management of this type of colitis.

The Rectal Treatment in Gonorrheal Proctitis or Coloproctitis. Inasmuch as this condition is almost always in the rectum or in the rectum and sigmoid, the condition usually is classed as purely rectal and the treatment likewise rectal.

It is not necessary to discuss the treatment of the various types of complications seen in this disease. It is not pertinent to any treatment associated with colon management excepting where such management is beneficial to the local lesion.

The necessity for thorough sigmoidal and rectal examination again should be emphasized in this condition. Sigmoid and rectal narrowing and stricture, a result of a previous gonorrhea, invariably is regional and usually is seen only in its later stage. Secondary ulcerations may accompany. These may be of the Bargen diplococcus and treatment should be in accordance.

One case seen, gave symptoms and findings of a perianal abscess, that resulted in a fistula. The rectosigmoid and upper rectum showed an early gonorrheal ulcerative proctitis on sigmoidoscopic examination, which necessitated active treatment before operation was advisable. The complete cure of the gonorrhea on the other hand, was only by fistulectomy.

The Rectal Treatment in Megacolon.[13-15] In megacolon rectal treatment has been given and suggested as important in the management. In certain cases[16] it may have a direct bearing on effecting a cure of the condition, though not necessarily in the severe case of a true congenital idiopathic dilatation of the colon.

A mild or severe acquired dilatation may accompany any obstructive lesion of the rectum. In certain mild cases seen, it came apparently as the result of an abnormally functioning bowel due primarily to rectal disease. Further investigative work may throw more light on an embryological contributory factor in the adult case. There is enough evidence in fact to signify that even the congenital idiopathic dilatation of the colon is many times an acquired abnormality. One rather mild case of a congenital idiopathic dilatation of the colon which gave a history of bowel movements since childhood that were as infrequent at times as to occur only two times a month, responded entirely to medical management. She has remained symptom free for practically a year's time. Her treatment could be considered partly rectal only inasmuch as among other things repeated colonic irrigations were given over a short period of time and in addition a mild anal dilatation was done on several occasions.

The treatment of choice for a severe congenital idiopathic dilatation of the colon however is given as lumbar sympathetic ganglionectomy[17-18] and ramisectomy; or else as recently advocated by Rankin and Learmonth,[19] section of the sympathetic nerves of the distal colon and the rectum on the supposition that a rectal abnormality in part was responsible for the resultant megacolon.

The Rectal Treatment in Tabetic Colon.[20] The tabetic colon is accompanied by a relaxed, atonic rectum, that assumes as in one case seen, a megarectum. The sphincter is atonic and the anus patulous. There is no need for rectal treatment.

The Rectal Treatment in Amebic Dysentery and Other Parasitic Diseases of the Colon. Certain parasitic infections as that of amebic dysentery require no rectal treatment for their care. The symptoms remain primarily colonic, because they result from a descending infection and are not ascending in type.

However, certain parasitic diseases give severe rectal symptoms and require rectal treatment to eradicate the disease and to render the proper prophylaxis.

A case of oxyuris vermicularis, or pin worm, was characteristic of the parasitic class. This came for treatment of severe pruritus. Anal cleansing and ointment were necessary to prevent reinfection and spread of the disease, as well as to give relief from the pruritis, although specific medication was the principal agent for final cure.

The Rectal Treatment in Multiple Polyposis. Rectal polypi often signify the existence of other polypi that cannot be visualized and are not amenable to treatment rectally.

The high incidence of cancer of the colon following multiple polyposis, the frequent association of polypi with carcinoma in the colon, and the frequent and early malignant degenerative changes in polypi, necessitate the careful removal of all polypi visualized through sigmoidoscopic and proctoscopic examination.[21-23]

Any adenoma should be considered as a highly potential malignancy and should be treated accordingly.

The Rectal Treatment in Diverticulitis. If we are to consider rectal and colon irrigations as rectal treatment in diverticulitis, such rectal treatment should be considered as highly important in the management of this condition. However, the indication for such treatment depends on many factors.[24] In the acute cases of diverticulitis of the sigmoid, surgical treatment may be necessary, but considerable care should be taken in judging the type of diverticulitis, the extent of its progress to abscess formation, and the consequent risk to the patient before surgery is resorted to. Hot irrigations given in the knee-chest position, in association with withdrawal of food or fluid by mouth, absolute rest in bed, the use of ice to the abdomen and other medical measures may be indicated in preference to surgery and, if done with care, in my own experience, have rendered later surgery unnecessary.

The Rectal Treatment in Carcinoma of the Colon. This subject should be included in this discussion of the management of colon diseases through rectal treatment because too frequently rectal treatment is given with the mistaken idea that such treatment is indicated, whereas a colon cancer in reality is present.

Fewer cases would be declared inoperable were more cases examined routinely. Not a few cases give no history of bleeding and yet have an advanced carcinoma. Bleeding should therefore

not be the criterion used to indicate the necessity for sigmoidoscopic or proctoscopic examination, although bleeding always indicates the need for such an examination. A barium enema roentgenogram examination of the large bowel should routinely follow the visualization of the lower segment of colon not only to more definitely localize and reveal added pathology, but in all cases where an abnormality of colon function exists, to rule out the possibility of cancer.

A most considerable advance in the recognition of early carcinoma of the large bowel may be obtained through use of the air inflation barium roentgenogram, recently advocated by Weber.

In closing, emphasis should again be given of the necessity for routine sigmoidoscopic and proctoscopic examinations in all cases of a dysfunctioning bowel, regardless of the cause of its abnormality.

SUMMARY

1. Many cases of the so-called "colitis" are in reality an abnormally functioning bowel.

2. A large number of these cases have symptoms that are produced through rectal disease and consequent dysfunction. The symptoms of the dysfunctioning bowel may be produced through any artificially provoked rectal irritation.

3. The frequent neglect of the rectum as a focus of infection or as an irritative factor provocative of a dysfunctioning bowel is due not only to the infrequent use of the sigmoidoscope or proctoscope, but to the peculiarity of the nervous innervation at the anorectal region and the diffuseness of infection in this region.

4. The treatment of the dysfunctioning bowel frequently necessitates rectal treatment and in addition should require general dietary and medical management until normal rectal function occurs again. Other causes than rectal disease may be responsible for the abnormal function and should be borne in mind or treated in addition.

5. Reasons were advanced for believing that anorectal disease might precede and be the precipitating cause for a chronic ulcerative colitis infection.

6. Chronic ulcerative colitis, gonorrheal coloproctitis, tabetic colon, amebic dysentery and parasitic diseases of the colon, multiple polyposis, diverticulitis and carcinoma of the colon were discussed in their relation to the rectum.

7. A brief discussion was given regarding the treatment of the rectum and the relationship that it bore to the management of colon diseases.

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THE CHILDHOOD OR JUVENILE TYPE OF TUBERCULOSIS*

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It is now more than two decades since many of the foremost exponents of the tuberculosis control advocated a rational tuberculosis therapy and leading internists, like Hamburger, v. Pirquet, Grancher, Williams and others of that well known school, taught that if we could carefully examine all the children for tuberculosis—both infected and the diseased; this to be followed by appropriate care and suitable treatment, that in about twenty years both the tuberculosis mortality and the morbidity would be reduced to a minimum, would in part be stamped out; if not stamped out entirely it would at least be somewhat reduced. The twenty years have now passed. Have we made any perceptible progress in the reduction of the tuberculosis mortality and morbidity from our community? We have undoubtedly progressed along these lines, but most inadequately, because an examination of all small children, from infancy to the school age, including the "teen" age, could not be accomplished; in fact, but a very small percentage of the children throughout the land were examined during these twenty years, and taken care of. Were we remiss in our duty to stamp out this social plague? Perhaps!

About ten years ago much stress was placed on diagnosis of tuberculosis in what is known as the "teen" age, the school period, when the glands about the hilum near the roots of the lungs, often become both infected and diseased. The involvement of these glands is usually designated as the primary form of tuberculosis, the childhood type of the disease, and the involvement of the lungs proper, as the tertiary form; this most frequently in adult life, being the aftermath of the very early infection and subsequent disease of these glands in childhood life. But why wait for the child to arrive at the "teen" age to make this diagnosis? From the beginning of life, from very early infancy up to the first period of childhood, the kindergarten age, the examination is just as important, perhaps more so, than a few years later, and here—at this early period—in infancy and up to the fifteenth month the tuberculin application in the form of the Moro ointment is the method of choice, and as the child approaches the kindergarten age, the v. Pirquet should be given, and on all those children giving a negative reaction following a v. Pirquet, an intradermal or Mantoux test should be made, because observations have shown that about 65 per cent. of all children in large cities react to the v. Pirquet test and out of those who do not react at least 15 per cent more react to the intradermal test, making a total of 80 per cent. reactors.

This childhood type of tuberculosis is usually typified in infancy or child-life. It is the infection and subsequent disease which we so often find about the root of the lungs, the regional glands, about the trachea and bronchi; this is designated as primary tuberculosis, the adult form of tuberculosis is only occasionally found in child life; however, in some instances the more grave adult type is found and the less severe, the juvenile type, is sometimes found in adults.

Now as to the pathology of this childhood or juvenile type of tuberculosis. The infection usually has its inception in early infancy or in child life, and whereas, if only a few tubercle bacilli gain entrance into the human economy may bring about a relative immunity; it being a "Godsend in disguise," a large or massive infection, when bacilli in large number enter the human body, may then produce a more or less rapid tuberculous process and an early death. As in more than 85 per cent. the infection is brought about by the inhalation of air through the upper air passages; this being the chief portal of entry, this then, the aerogenous or bronchogenic route, is the usual route of predilection to human infection. Tubercle bacilli are carried with the respired air into the bronchial tree, find lodgment in the pulmonary parenchyma, usually subpleurally, at which point they may gradually increase in number and the lymph flow from this primarily involved pulmonary tissue is towards the nearest, the regional glands, and the bacilli are deposited there. If the resistance of the child is good, then the bacilli may be deposited for a greater or lesser period and no further pathology may be observed; usually, how-

*The signs and the symptoms. Diagnosis. Prognosis. Prophylaxis. Therapy.

ever, they increase in number, may be walled off or undergo calcification and the result of this process gives the physical findings in and about the hilus region; this also gives the increased shadows on the roentgen plate, on x-ray examination. These are the findings described as the childhood type of tuberculosis. Now, as this first or primary infection in the pulmonary tissue undergoes fibrosis, hardening or calcification, it is now shown on the roentgen plate as dark circumscribed shadows described as the "Ghon nodules." In adult life pulmonary tuberculosis is usually a secondary aspiration process from these peribronchial glands. Further we notice that if the primary lung involvement is in the right pulmonary tissue, then the regional glands about the hilum, the peribronchial glands, of the right side become secondarily involved, and if from the left lung then the mediastinal glands on the left side are involved. Crossed infection, that is, right-sided primary lung involvement, and left-sided hilus gland enlargement, as a secondary infection has never been observed. If only a single "Ghon nodule or focus," the primary lesion of the primary infection, is observed in the pulmonary parenchyma on the right side, then only the right sided, the regional glands about the right hilum become secondarily involved, and vice versa. The Ghon nodules may vary in size, usually from pinhead to the size of a pea; these may eventually become completely absorbed; it is owing to this fact that they are not always demonstrable on the roentgen plate. The child becoming infected from an open case of pulmonary tuberculosis, usually the bronchial glands are primarily infected and later become primarily diseased; this is designated as primary tuberculosis, and this is the usual forerunner of pulmonary disease in adult life, the tertiary form of the disease.

The Signs and Symptoms of Tracheo-Bronchial Gland Tuberculosis. The signs may be quite characteristic, or there may be an absence of all objective signs. Pain in the anterior chest and posterior interscapular backache may be much complained of. A painful cough with an expiratory stridor, hollow, barking, metallic, whooping cough-like is often noticeable. This piping, high, expiratory murmur is much increased on exertion. There may be emaciation, gastric and nutritional disturbances, discharges from the ears or eczematous patches about the ears, multiple abscesses, slight fever and bronchopneumonic areas about the bases of the lungs. An expiratory dyspnea, a harsh and loud sound, expiration much prolonged, inspiration scarcely audible (in ordinary whooping cough the inspiratory sound is much prolonged, the expiratory murmur shortened) and inspiratory contractions of the chest, due to pressure of the enlarged endothoracic glands upon the trachea, some emphysema of the lungs, cyanosis, and in long protracted cases clubbing of the fingers usually bespeak primary or peribronchial gland tuberculosis. In spite of the frequency of bronchial gland tuberculosis in the first and second, and perhaps up to the fourth and fifth year of child life, the kindergarten period, these characteristic signs are but seldom observed and endothoracic gland enlargement is during early child life infrequently diagnosed.

The Diagnosis of (Primary) Tuberculosis of the Intrathoracic, the Perihilar Glands. In pulmonary tuberculosis in the adult we make use of the classic method of physical examinations by inspection, palpation, percussion, auscultation and roentgenology, and here, in the interpretation of the signs elicited over the area of enlarged or tuberculous peribronchial glands we again make use of this same well tried method of physical examination.

(A) *Inspection:* We may find a frail child with a sunken contracted chest, dilated pupil on the affected side, due to pressure upon the sympatheticus from the swollen glands, unilateral sweating or flushing of the face, conspicuous temporal veins on the affected side; skin usually dry and covered with a downy growth of hair.

(B) *Palpation:* If the little patient standing before the physician, is placed so that the doctor can comfortably place the fingers of his right hand along the spine, the fingers of the left hand on the sternum and now, if pressure is made from the second cervical down to the seventh or eighth dorsal spine, in an up and downward movement, and while this is being done, if the doctor watches carefully the facial expression of his little patient, he will often observe that when a certain spinous process is pressed that the child will flinch, as if in pain. This is often described as spinalgia, as first pointed out by Petruschky.

(C) *Percussion:* On the normal child the percussion note may be dull and osteal down the spine, usually to the second thoracic vertebra and pulmonary below that point, but a dull and high note to the fifth or seventh dorsal spine is always pathological. This dulness may extend a few centimeters from each side of the spinous processes as far as the paravertebral line, and over this area the tactile fremitus is then also increased.

(D) *Auscultation:* If we listen carefully with the stethoscope along the spine of the normal child while breathing, beginning upon the neck over the third or fifth cervical vertebrae, we will note distinct bronchial breathing, and as we proceed downward it becomes fainter, and is nearly lost at the second thoracic spine, but in the child with enlarged peribronchial glands the tubular sound heard up in the neck is carried down to the sixth and seventh dorsal spine and beyond. This is described as spino-tracheal breathing, and the whispering voice, which is also heard in the presence of endothoracic gland enlargement down to the sixth or seventh dorsal spine, is spoken of as D'Espine's sign.

O. de La Camp considers the physical possibility of diagnosing bronchial gland tuberculosis, chiefly the tracheo-bronchial, situated at the hilum. The symptoms are variable, and are chiefly present in pronounced cases, although the principle symptoms of gland enlargement are usually present. The characteristic dry, brassy cough, an expiratory dyspnea, slightly husky voice, difference in the pupils, pain between the shoulder blades, pain on pressure from the second to the seventh dorsal spine, and over this area both the whispering and the loud voice are intensified and the percussion note a relative dulness to the sixth or seventh dorsal spine, on light or moderate percussion indicates peribronchial gland enlargement.

(E) *Roentgenology:* Roentgen-ray and tuberculin in the diagnosis of the childhood type of tuberculosis. An x-ray plate is the objective representation of that which can be seen by the Roentgen ray. A radiographic examination is often of great aid and may, in some instances, lead to an immediate diagnosis. It is especially valuable in children at any age, where the clinical examination is often difficult and the findings misleading.

The statement made by many good clinicians that the childhood type of tuberculosis can be determined ONLY[1] by means of the tuberculin test and the roentgen ray is misleading and does not always hold true. In the presence of evidence that many good diagnosticians do make the clinical diagnosis of tuberculosis in children without the use of the x-ray or tuberculin is sufficient proof. Should the general practitioner assign all his cases of childhood disease at once to a roentgenological technician for an x-ray examination, and to a tuberculosis nurse for a tuberculin test? Is the technician and the nurse to make the diagnosis for the doctor? We lay great stress on teaching the young medical student his physical diagnosis; teach him how to elicit and interpret the sounds heard within the chest wall, and after this teaching is fairly well grounded, the young doctor is advised to refer all his chest cases at once to an x-ray technician and a nurse, as the only ones capable of making a correct chest diagnosis. A good and careful clinician can make a fairly accurate diagnosis on the living body; this may then be corroborated by a roentgenological examination. I refer to the childhood type of tuberculosis, the disease of the peribronchial glands, the usual forerunner of the adult type of tuberculosis. With the x-ray the diagnosis of peribronchial gland tuberculosis can very definitely be demonstrated, but it is possible in six-sevenths of all cases to make a correct diagnosis without the x-ray by means of physical examination alone.

It is freely admitted by many roentgenologists that exact standards for the x-ray plate in the normal can not always be determined; hence it must naturally follow that such standards of perfection can not always be determined for the pathological chest. On close observation we find that evidence of a pathological process in the case of one technician may indicate an entirely different process by another. With a clinical history, a careful physical examination and laboratory findings one can arrive at a very definite conclusion as to a proper interpretation of a doubtful picture.

Years ago, while conducting a Children's Clinic, a leading internist, internationally known—a past president of the A. M. A. visited

1. The word "only" as given above—appears always in large type.

my clinic and the problem which interested him most at the time was "Doctor, do you see many cases of pulmonary tuberculosis in children here in your clinic?" My reply was "that I do not and that only very occasionally do I see a case." "If you do not see them, then where are they?" I replied "that most of them are found in the text-books and in the writings of the supposed specialists on childhood tuberculosis." "I believe that you are right—for in all my years of experience I have seen but few cases." As in childhood tuberculosis the intrathoracic glands about the hilum are usually the chief form of tuberculosis at that age, we find that much stress is placed on the use of an x-ray examination, and on the tuberculin test but not a word about diagnosing the presence of enlarged or tuberculous mediastinal glands by physical examinations, and as for therapy and prophylaxis no mention is made; whereas, these latter are by far the most important factors in the care of the tuberculous child. By means of the physical examination of inspection, palpation, percussion and auscultation, so admirably in use when examining an adult for a suspected tuberculosis within the thoracic cavity; with these same physical tests, if carefully practiced and correctly interpreted, chest findings about the hilum can be made with a degree of accuracy equal to the findings in the lungs. We do not deny that the roentgenographic plate is a great aid in our diagnosis of enlarged intrathoracic glands, but this method of examination should not be given the preference, and exclude wholly the old well-tried and often applied physical method.

Prognosis: The prognosis of tuberculosis in childhood is not as grave as it is in infancy; here the process is longer drawn out, and exacerbation and remissions are frequently observed, infection may be more mild. In the second child age—the so-called "teen" age—from 5 to 15, the prognosis in tuberculosis is still more favorable. At this period the experience of the profession tends to prove that pulmonary tuberculosis has a lessened tendency to progress than in the first year of life, or again later in life, after puberty. It is quite infrequent to observe, during the school age, a florid pulmonary tuberculosis and Granchcr observed a decided lessening of the mortality rate between the 5th and 12th year, due to an acquired relative immunity and others have also observed a lowering of the mortality rate from 4 to the 15th year. The tendency to a generalization of the disease becomes less and assumes a more chronic form. In these years—from 5th to 15th, the infection tendency is lessened; consequently the tendency to the disease also becomes less. It is not infrequent at this age to see a chronic form of pulmonary tuberculosis with a decided tendency at healing as in the adult. Our own observations are that pulmonary tuberculosis is very infrequent in the school days or early child life; it only begins to make its presence definitely known as the child approaches puberty. In the early school days other forms of tuberculosis are more frequently seen and bone and joint tuberculosis, tuberculosis of the intestinal tract, tuberculosis of the kidneys, the cerebrum and other organs, but pulmonary very seldom.

The prognosis of pulmonary tuberculosis is most unfavorable during the first year of life—that is, in infancy, the nursing period—the period from the first day of babyhood to about the end of the 15th month, and the earlier in infancy the infection, the graver is the outlook; here often an early generalization of the tuberculous process may be observed. It also is unfavorable during the first period of child life—that is, during the years from the middle of the second to the end of the 4th, perhaps the 5th, or the kindergarten age, to the beginning of what may be called the pre-school age, it becomes more favorable as the child advances toward this pre-school age. Again it is most unfavorable with the beginning of puberty—about the 15th year of life—the beginning of the developmental period and extending through to the age of full development and up to about the 25th to 35th year, becoming again less favorable after the age of 60—about the period of beginning senility and extending throughout the senium.

As to the years of a more favorable prognosis, we may state that relatively the years of the second period of child life, that is, from about the 5th to the 15th year, before puberty, is the most favorable. This also is known as the period of childhood disease, embracing the pre-school, the school, and the high school age, or what is now so frequently mentioned as to the "teen" age, including the 10 years from the 5th to the 15th; the second period of child life. The other, more

favorable period of life is that of full body development—from about the 35th to near the 60th. After the 40th year the acme of body resistance has reached its highest point, which is then usually maintained for years, and the tuberculous process, if present, assumes a very slow and very chronic form, with little exacerbations and remissions.

Tuberculosis in childhood is usually a mediastinitis, perhaps a polyadenopathy—a disease of the mediastinal, the regional glands about the hilum of the lungs. In some instances a miliary form of the disease may be the presenting picture, an early generalization; this from a caseating gland emptying its contents directly into the blood stream. This then may be accompanied by a meningeal, abdominal form; in fact, any organ and tissue may become more or less involved. *This, the mediastinal form of the disease,* is usually spoken of as "childhood tuberculosis."

Prophylaxis: This is to prevent the infection of the child and to increase its resistance. It becomes the first duty of the mother to protect her infant from becoming infected, and after infection it becomes her duty to prevent the child from becoming tuberculously diseased. It is here when the good old family doctor's duty to the small child comes into play—must be exercised. The well known axiom of v. Behring "Pulmonary tuberculosis in the adult is simply the last strain of that song which was first sung at the cradle" brings pulmonary tuberculosis, as is observed in the adult, back to childhood. Tuberculosis is primarily a child disease; it is acquired in childhood, is preventable in childhood, should be treated in childhood, and can be arrested in childhood. With the introduction of tuberculin by v. Pirquet, as a specific diagnostic measure, the early infection and subsequent tuberculous disease was again definitely placed in childhood, and all this only goes to prove that suitable therapeutic and health measures directed against the disease must begin in childhood; hence, to increase the resistance in our little patients we must insist upon good housing conditions, wholesome fresh air, and good nourishing food, sufficient rest, a well regulated life, with much out-of-door living, frequent baths, much sunshine, and in the open—and under constant observation of the good old family doctor. These are the factors necessary to insure the child's resistance and inhibit the outbreak of a tuberculous disease in later life.

Infants under two years of age should be protected against infection, and all children should be immunized against tuberculosis by inoculation before reaching puberty, and here it may be stated that immunization is usually brought about in the child with good resistance by coming in contact with minute quantities of the tuberculous virus; this then may be designated "the inoculation method." It is to be noticed that in about 5 per cent. of all forms of tuberculosis in childhood that the bovine tubercle bacillus is the activating factor.

TREATMENT OF THE CHILDHOOD OR JUVENILE TYPE OF TUBERCULOSIS

General Therapy: Many years ago the great Sir William Osler tersely stated that "without a thorough knowledge of tuberculous disease no physician is adequately equipped to engage in the art and practice of medicine." This statement made by this great teacher is particularly applicable in the care and treatment of the childhood type of the disease. "To recognize it early and to treat it early" must be our watchword.

As soon as the diagnosis of tracheo-bronchial lymph node disease has been definitely made—no matter how well the general condition of the child may appear it becomes the imperative duty of the family doctor to institute proper therapeutic measures, and a symptomatic treatment under hygienic rules is here most advisable, and the earlier the diagnosis is made the better is the outlook for the child; this in early infancy—in the first period of childhood—even before the "teen" age so much advocated in late years as the "danger" period. The child must be under constant observation and care from the time the diagnosis is positively made throughout all the years of early childlife—so as to immunize the child that it can be safely carried through the greatest period of danger—the years of puberty and beyond.

The anemic child to increase its resistance and raise its immunity, besides a suitable aliment, the administration of the Syrup of the ferrous iodide and glycerine, in equal parts, and here direct the nurse to administer to the child half teaspoonful doses in a spoonful of water three times a day—after meals. The giving of cod

liver oil in a palatable form—so plentifully now on our markets, is a most suitable medicament and aliments rich in vitamines—like eggs, butter, milk and salmon, can not be too highly endorsed, or some of the many vitamine rich pharmaceutical preparations may also be given. A most dependable remedy is the ordinary U. S. P. Tincture of iodine when given in a little milk in 5 to 10 drop doses after each meal, and Fowler's solution of arsenic in pronounced anemia in 2 or 5 drop doses, after meals, is a sovereign remedy. Cathartics, as a rule, should not be given. Regulate the child's bowels by an appropriate diet, and here the cereals and various breakfast foods can be highly recommended. Of the many therapeutic remedies for the treatment of childhood tuberculosis none can excel the use of a dependable tuberculin dilution. To tuberculin must be assigned the most conspicuous place for the treatment of peribronchial gland tuberculosis and palpable cervical tuberculous glands from bacilliary infection by way of the mouth, teeth or tonsils have been noticed to disappear as if by magic.

The Specific Therapy: A specific tuberculin therapy, according to good authorities, is most desirable. This, the specific method of treatment so ably tested by Petruschky, is best applicable from the first to the sixth year; here, following the medication is a suitable condition of improvement, an increase of body weight and a lessening of the bronchial catarrh. Some, equally well informed, advocate the beginning of the specific treatment with the school age, this to be maintained more or less throughout the whole school years. In the milder forms of the disease it is very noticeable that an extended specific treatment offers the best method of favoring a healing of the tuberculous process. In the more grave forms of the disease—like acute pulmonary tuberculosis, this treatment is strictly contra-indicated. In this fight against tuberculosis it is the primary state of this disease that we must consider most seriously—this in childhood tuberculosis, so that we may in later life inhibit the pulmonary form.

Petruschky, of Danzig, many years ago advised the use of tuberculin as a topical application, by inunction, in the use of his "Linimentum Tuberculini Compositum." This was then highly commended by leading phthisiotherapeutists in Europe. Now, for more than twenty years I have used, with gratifying results, a 1 per cent. solution of O. T. in glycerine, by inunction. This can very readily be prepared by any apothecary, or by the doctor himself. A clean, empty 3-ounce graduated prescription bottle, this usually holds 100 C.C. a 1 c.c. of O. T., pure glycerine, and a few C.C. of distilled water. Take 1 C.C. of Koch's original O.T.: pour it into the empty 3-ounce bottle. Rinse the now empty 1 C.C. bottle repeatedly with a few C.C. of distilled water, shake well, and now add 15 C.C. of glycerine. Shake, and when thoroughly mixed, add 30 C.C. more of glycerine, again shake well, then add 30 C.C. more and when well mixed add sufficient glycerine to make 100 C.C. or fill the bottle to within 2½ centimeters from the mouth of the vial, and mix intimately. This now is a 1 per cent. solution of old tuberculin in glycerine and of this dilution, with a medicine dropper, place a drop upon the right forearm of the child and with the middle finger of your right hand rub it well into the child's skin till all has been absorbed. This usually will require but a few seconds. The next night do not apply tuberculin, as you did the previous evening, but the following evening repeat the process. In other words, apply the tuberculin every alternate night and always make the application to a different spot on the body. Before beginning the tuberculin inunctions obtain an accurate weight of the child, and after applying the medicine for about three months again take the weight and report these findings to your family physician. Of this tuberculin-glycerine mixture do not dispense large quantities—never more than 10 to 15 c.c. or ¼ to ½ ounce; this quantity if used in one drop doses every other night will last for months. We have now dispensed many hundreds of ½-ounce vials, half filled, of this tuberculin-glycerine mixture to many hundreds of children and we insist very vigorously in its proper application. Occasionally we discontinue the tuberculin medications for a few months and in the interim the child is put on a ferrous iodide and glycerine medication, equal parts, and the parents are directed to give the child a half teaspoonful dose three times a day, with water, after the meals.

Clinical Observations and Findings: We began the conduction of a chest or health clinic during the winter months, beginning in the late fall of

1928 and continuing up to the present time (spring of 1932). These clinics were given weekly occasionally bi-weekly. In this work we were ably assisted by two well-trained nurses, who during that time gave a total of 862 tuberculin tests, 60 Moro or percutaneous, 160 v. Pirquet or cutaneous, and 642 Mantoux intracutaneous or intradermal. The Moro test was applied only to infants or very small children—up to the third year of life, the v. Pirquet usually from the third and up to the sixth year, and the Mantoux to all over the age of six and up to the full adult life; in a few cases, even in the senium. In all young patients, at any age, a careful physical examination was made along the spine to the seventh or eighth dorsal vertebrae and in all cases where a physical examination warranted a tentative diagnosis of mediastinal gland enlargement was made. In every adult examined, besides making a careful chest examination for pulmonary disease, a physical examination along the spine was made the same as in the children; in many a diagnosis of pulmonary tuberculosis was made, and in addition the presence of enlarged peribronchial glands was demonstrable. To all the children who were examined those of the first period of childhood, as well as those of the second, the "teen" age, and who gave a positive tuberculin reaction the tuberculin-glycerine inunction method was recommended. This form of treatment was not continued indefinitely but after a few months of a tuberculin impression, say, for about four months, was then discontinued for a month or so, and then again resumed. Here, by this method of tuberculin medication, under the spillway of the ultraviolet-rays many gratifying observations were made. In not a single instance have we observed any untoward results, and with the hearty cooperation of parents or guardians, we are looking hopefully forward to a lessening of the tuberculosis mortality in the ages of puberty and beyond. In the examinations of these many children we found only two cases in which the adult type of the disease was present; of these one child has since died of progressive pulmonary tuberculosis, the other child now entering womanhood is holding her own, returning for a reexamination once in three or four months. The Moro reactors were all small children, mostly infants; the youngest only three months old. Of the children to whom a Moro test was applied, 60 in all, 44 gave a negative and 16 a positive reaction. Infants who react very actively to a Moro test must be constantly under observation; in all probability must be considered more than simply infected, perhaps already slightly diseased. Of the v. Pirquet reactors, 160 in all, 81 positive, 79 were negative, all were children from the third to the sixth year, and a Mantoux test was applied to 642 patients, of whom 447 gave a positive reaction and all the reactors of all these groups were directed to the roentgenologist for a roentgenogram to confirm our findings.

SUMMARY

From puberty to the age of full body development, that is, from the sixteenth to the thirty-fifth or fortieth year, Cornet's truism is usually noticeable—that "in pulmonary tuberculosis the younger in years the adult individual the graver is the prognosis." Hippocrates early observed that from 16 to 35 is the most grave and all modern clinicians agree that the developmental age, from puberty to about the 35th year, shows the greatest mortality rate. It seems as if the tuberculosis mortality rate begins to rise with the fifteenth year, that is, after the "teen" age—at puberty. At this period there is greater tendency to a more rapid progression of the pulmonary process with but little tendency at any improvement or healing. It has also been observed in general that after puberty it is much more difficult to contract tuberculous infection or disease, but that infection, if contracted after puberty, becomes more grave, is a more dangerous affair.

If the infant, the child, the youth, and later the young adult, is safely carried over to full adult years, then the infection will be so well neutralized as to remain in perfect quietude. A so treated child will have learned its lessons well, will be a good pupil to teach the principles of hygiene. Being constantly under the supervision of the family doctor does not mean that the child must continually be drugged and must always take medicine. Apply here as in everything else—common sense. See the patient frequently, inquire about the health of the little patient, about the weight, the mode of living, and also occasionally make a thorough chest examination, as well as an occasional roentgeno-

graphic picture as a comparison with a previous picture taken. While under the family doctor's care these little patients must always be encouraged, must be told that the patient is only under observation and not actual treatment. Throughout the years of the use of tuberculin, in the form of glycerine inunction in the younger years and in young adult, or full adult life, a small tuberculin impression, say,. a millimilligram, once or twice the month, will be followed by most favorable reports.

With the use of tuberculin we activate a tuberculin immunity, for with this medicament a tuberculosis immunity cannot be acquired. The use of tuberculin in the tuberculous in minute doses only inhibits the growth or spread of the process; this, then, favors a healing tendency. Our conception, in the use of this dermal, local or surface application or vaccination, the tuberculin-glycerine medicament, is to make the harbored tubercle bacilli less pathogenic; this ultimately brings about an artificial immunity, a desensitization—this, with increased resistance.

During these years—now in the fourth—we have probably examined at the City clinic more than 600 children. Our interest centered principally in the child group of 60, the 160 which receive the v. Pirquet test, all in the childhood group, and to approximately 400 children of the 642 to which a Mantoux test was given. This included all children from babyhood to past the "teen" age. Of the infant type the Moro test was positive in 16; of the first child group 81 gave a positive v. Pirquet, and in about 300 children of the second group a Mantoux test was positive—a total of about 400 reactors are now under observation.

If this class of reactors can safely be carried through puberty and beyond perhaps past the 25th year, the impressions made on these individuals for better hygiene will be a lasting one and we can confidently look forward with hope that this disease, tuberculosis, can in a measure be stamped out. This was the wish and hope of those good teachers who predicted that if tuberculous disease were recognized early, in youth, that it could be fairly well stamped out in about twenty years.

We are now passing on many susceptible children tuberculously infected, and as they are diagnosed are at once placed into this large and growing group of reactors, so that in the following years we will have a large class belonging to this childhood type of tuberculosis. The vigilance of our nursing force is strictly maintained; health topics are continually mentioned and the application of the tuberculin-glycerine inunction is our chief weapon in this fight against childhood tuberculosis. We are looking forward to the time when we have registered many hundred children in our group of reactors; then we have positively demonstrated that when this childhood tuberculosis is early recognized and with early care is carried through the early child period, has passed the "teen" age successfully, that then the period of greatest danger is overcome; that now the child is successfully immunized so as to pass the period of early manhood and womanhood and up to adult life. Under a strict regime we may be able to report in the coming years a lessening in the tuberculosis mortality and morbidity from our constantly growing group of childhood reactors.

At the very first visit to the clinic and after the child is examined, and we have made our diagnosis as to the positivity of the infantile type of tuberculosis, we explain to the parents or guardians the great danger to which the child will be exposed in later years; that for the present the child is in no immediate danger, but as life goes on and the child reaches puberty that then is the greatest danger of becoming tuberculous diseased, but if carried safely beyond and up to the 25th year that in all probability the individual will remain free from tuberculosis. At every visit of our nurse to the home, and at every visit of the parents to the clinic, the nurse again and again repeats the vital importance of carrying the child safely through puberty. This is their watchword for the prevention of pulmonary tuberculous disease. The nurses are at all times fully conversant with the condition of the children under their care.

We are now looking forward to the coming years with a great deal of hope and assurance that all of the children who have passed puberty and beyond, to the beginning of full body development, are in perfect health and safety—free from the pulmonary, the adult type of tuberculosis. At this writing we are more than pleased to note that our admonitions are fully

carried out to the letter by the parents or guardians.

We have inaugurated in our diagnostic clinical work a "follow up" system. The nurses visit the homes of these little patients every few months throughout the year to see that the method of care and treatment is rigidly carried out; insist that all the children be returned to the City clinic at regular intervals for another examination.

Of the many children who have come to our diagnostic clinic and who are now under our observation, now more than three years, we have not had a single child who has passed out of the childhood type of the disease and has entered into the adult type—the pulmonary form. Our chief aim is to prepare these children for adolescence, to carry them safely beyond that period, when with increased resistance tuberculosis as a disease entity is permanently inhibited.

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NEW OBSERVATIONS ON DENTAL CARIES

A symposium on dental caries was held in Pittsburgh, June 23, 1932, under the auspices of the International Association for Dental Research. The main papers were presented by Dr. H. E. Friesell, Dean, University of Pittsburgh School of Dentistry, and Dr. J. J. Enright, a research specialist of Mellon Institute. These contributions gave the first complete account of the results of a comprehensive scientific investigation of dental caries that has been in progress at Mellon Institute and the University of Pittsburgh during the past nine years. Prominent scientists who discussed these findings at the meeting were Dr. William J. Gies, Columbia University, Dr. Edward H. Hatton, Northwestern University, Dr. R. W. Bunting, University of Michigan, Major F. E. Rodriguez, Dental Corps, U. S. Army, Dr. Philip Jay, University of Michigan, and Dr. Theodor Rosebury, Columbia University.

Dr. Friesell gave a description of the present status of the scientific knowledge of dental caries and followed with a presentation of the clinical aspects of the disease, pointing out that the peculiar localization of the carious processes could be correlated as due to active causative agents in the immediate environment of the teeth. He reported that a knowledge of the fundamental facts of embryologic and histological nature indicated that nutritional factors are important in a secondary or predisposing manner.

Dr. Enright reported studies of the effects of acids on enamel with simple lactic acid and citric acid buffer solutions which etched enamel in all ranges studied even in the neutral and slightly alkaline range. That tooth enamel under natural conditions in the mouth was not dissolved over the entire crowns of the teeth was shown to be due in large measure to the fact that saliva in all of the 225 cases studied was saturated with tricalcium phosphate. In an additional study of the effects of acids on enamel, in which certain pertinent characteristics simulated conditions of the local decay areas in the mouth, it was demonstrated that the degree of acidity necessary to decalcify enamel could be produced only by lactobacilli. The bacteriological study of carious and noncarious patients also showed that the activity of the disease could be correlated with the presence of lactobacilli. This was particularly true when the follow-up examinations were used to substantiate the bacteriological and clinical diagnoses. The mass of evidence presented by earlier workers, confirmed and amplified by these experimental results indicating the importance of lactobacilli, raised the question as to what type they were. An extensive taxonomic study of lactobacilli types from oral and intestinal sources gave a basis for classification of these bacterial forms.

Dr. Bunting discussed the progress that had been made in advancing the view that dental caries is an infective process in which specific types of bacteria, acidogenic and aciduric in nature, are resident on surfaces of teeth and by their acid production cause tooth destruction.

Major Rodiguez strongly commended the decalcification experiments and the proposed classification of lactobacilli. He called attention to the results of his bacteriological survey, which were even more encouraging than those reported by Drs. Friesell and Enright, respecting the importance of lactobacilli. He also pointed out the desirability of a quantitative rather than a qualitative technique in making bacteriological surveys of the dental zone.

Dr. Jay in his discussion suggested research for methods of controlling overgrowths of lactobacilli in the mouth. He reported that manipulations of the diet had thus far given the Michigan group more encouraging results than had drug therapy in effectively diminishing such overgrowths.

WAYSIDE VENDORS ENDANGER HEALTH

With a multiplicity of ice cream, soft drink and sandwich vendors crowding street corners and lining the highways in unprecedented numbers a new double danger to motorists and other patrons has developed. Any one of these vendors who happen to be a typhoid fever carrier may spread the disease far and wide among his customers. On the other hand, the careless parking car, even though briefly temporary, near these vendors adds an important hazard to traffic. All unhygienic food and drink dispensers whether in the open or behind the soda fountain counter are a positive and active menace to health especially at this time of year. The chief danger is not in the drink or food but in the personal habits of the one who sells it for immediate consumption.

Danger of this new hazard is emphasized by two important developments. First, typhoid fever is twice as prevalent as it was at this time last year in Illinois and the epidemiological evidence indicates that most cases originate from carriers, healthy people who are spreading the germs. Second, 8 typhoid fever carriers,

all of whom were milk or food handlers, were detected recently in Springfield in a search for the source of some 20-odd cases of typhoid which developed in Sangamon County. When a careless typhoid carrier handles sandwiches, ice cream cones, cracked-ice used for drinking glasses and the like just before serving, the value of all previous sanitary precautions is destroyed.

Using a drinking straw for sanitary reasons is useless if the clerk who passes it to you with soiled fingers is a typhoid carrier. No matter how sterile the ice when it leaves the factory, there is danger of infection if a typhoid carrier behind the counter breaks the ice in his hands before dropping it into the glass.

In short, it is the personal habits of the people who dispense foods and drinks that count. Typhoid fever is already unusually prevalent this year. Cases are coming from carriers. A carrier who dispenses food or drink is dangerous to health. The vendors are too numerous to permit an examination of each by the health authorities. People must exercise reasonable precaution on their own initiative if they escape danger.—*Illinois Health Messenger,* July 15, 1932.

A REAL BOY

A little boy went to school for the first time. When he returned home his father inquired how he liked it.

"It's all right, but they ask too many questions," said the lad. "First they asked me where you were born and I told them. Then they asked me where mother was born and I told them. But when they asked me where I was born I had to tell a lie."

"Why?" asked the father.

"I didn't want to say I was born in the Woman's hospital and have them think I was a sissy, so I told them it was in the Yankee stadium."—New York Sun.

PAINFUL ANEURYSMS OF AORTIC ARCH: RELIEF BY PARAVERTEBRAL INJECTIONS OF PROCAINE AND ALCOHOL

James C. White, Boston (*Journal A. M. A.,* July 2, 1932), reports three cases in which successful relief of pain was obtained in advanced aneurysms of the aortic arch. He states that the intense suffering that may occur in this condition, as well as the cardiac pain of angina pectoris, can be relieved by paravertebral injections of procaine or alcohol. Procaine injection is of diagnostic value in determining which communicant rami transmit the painful impulses to the spinal cord. It may give relief over prolonged periods. Alcohol, when accurately injected, causes permanent destruction of the sympathetic rami. The author emphasizes the fact that the paravertebral injection of alcohol is a poor substitute for sympathetic ganglionectomy in any patient who is a reasonably good operative risk, on account of the technical difficulty of injecting the alcohol with sufficient accuracy to be certain of destroying the ganglions or their communicant rami. However, in cases in which there are rapidly enlarging aneurysms, the dangers of cardiac decompensation, respiratory obstruction, or rupture of the aneurysm make a radical operation on the stellate and second dorsal ganglions quite out of the question. In these, however, paravertebral injection can be done with reasonable safety and a good chance of lasting relief of the chief complaint—pain. While actual prolongation of life is not to be expected from the relief of pain, it, may be brought about indirectly by permitting the exhausted sufferer to rest and sleep in relative comfort.

Society Proceedings

PIKE COUNTY

The Pike County Medical Society met in Nebo, Thursday, July 28, 1932.

A sumptuous dinner was served at the residence of Dr. J. H. Rutledge by Mrs. Rutledge and other Nebo ladies.

The meeting convened in the basement of the High School at 1:30, President J. H. Rutledge in the chair.

Considering the torridity of the day it was a fine place for the meeting.

The first number on the program, "Post-Graduate Medical Study in Europe," was given by Dr. Harold Swanberg of Quincy.

In a very pleasing manner, Dr. Swanberg told of his work over there during his seven months stay last year.

He told us much of Vienna, as by far the greatest center for post-graduate work in Europe, and of all its many advantages, but stated that Berlin, if the present plans of her medical men are carried out, would also probably become a center for medical study, comparable with Vienna.

He spoke of the wonderful progress of the Swedish men in medicine and especially in his own specialty of radiology.

Dr. Swanberg also gave us a great deal about all the many countries he visited, their institutions, their people, and the characteristics, manners and customs of the peoples, and of their economic condition at the present time. This paper was very interesting, instructive and entertaining.

Dr. Walter M. Whitaker of Quincy gave the second number, on "Practical Electrocardiography." This paper also was intensely interesting, as the author proceeded to tell of and exhibit to us many different tracings, some of normal hearts and many of various forms of cardiac pathology, concluding with a demonstration of his instrument upon several volunteer members of the society.

We had hoped to have some heart cases for him, but the heat and humidity of the day made it impossible to bring any of them in.

This paper, and the demonstrations, as well, were received with great interest by all present.

A resolution was adopted thanking the Quincy brothers for the program, and Drs. J. H. Rutledge, J. H. Goodman and R. P. Wells, our hosts, and the ladies for their hospitality.

Also the invitation of Dr. P. H. Dechow of Kinderhook to meet with him in October was accepted, after which the meeting adjourned in due form.

F. N. WELLS, Secretary.

Marriages

ANTHONY BAGNUOLA, Chicago, to Miss Janice Emily Livingstone of Baltimore, April 11.

WALTER EARL BARTON, Elmhurst, Ill., to Miss Elsa Viola Benson of Orange, Mass., July 2.

MARCO S. PETRONE, Chicago, to Miss Jennie Mikulich of Aurora, Minn., July 6.

CLARENCE W. RAINEY to Dr. Clarissa E. Devney, both of Chicago, April 30.

JOHN F. WIXTED, Sterling, Ill., to Dr. Julia M. Lundstrom of Chicago, July 16.

Personals

Dr. Samuel M. Feinberg, Chicago, addressed the Carroll County Medical Society at Savanna, June 17, on "Respiratory Allergy."

Dr. Chauncey C. Maher has been appointed assistant professor of medicine at Northwestern University Medical School, effective June 1.

Dr. Leon Unger spoke over the radio, July 26, on "Hay Fever."

A symposium on cancer was conducted before the La Salle County Medical Society in Ottawa, June 21, by Drs. Peter A. Nelson, Jr., Joseph E. F. Laibe and Herbert E. Schmitz, all of Chicago.

Dr. Cyrille Vermeren, Belgian consul since 1915, has been awarded the Cross of Officer of the Order of Leopold and promoted to the rank of consul-general, the newspapers recently announced. Dr. Vermeren was a practicing physician in Chicago for years.

Dr. John R. Harger was presented with a gift recently by fifty members of the staff of the Garfield Park Community Hospital. The presentation was part of a celebration in honor of Dr. Harger on his retirement as president of the Chicago Medical Society. Dr. Harger was one of the founders of the hospital.

An open-air dinner was given by the Randolph County Medical Society, June 17, in honor of Drs. James W. Weir, Sparta, and William A. James, Chester, to celebrate their completion of fifty years in the practice of medicine. Speakers included Dr. William K. McIntyre, St. Louis, on "Pruritus Ani."

At the annual meeting of the Chicago Urological Society held May 25, the following officers were elected: President, Gustav Kolischer; vice-president, Ben E. Fillis; secretary-treasurer, L. L. Veseen.

News Notes

—The state department of registration and education revoked the license of Dr. James L. Hawkins, Chicago, June 22, on his conviction of fraudulent misrepresentation in connection with the "American Society for the Conservation of Vision." The board revoked the license of Dr. Charles C. Keester, Wichita, Kan., July 7, on his conviction of first degree manslaughter.

—Physician members of the Chicago Woman's Club have been organized into the Navy Pier Committee to conduct a health program each Tuesday afternoon at 2:30, during July and August, on the Navy Pier, for the education of people who make the pier a recreation spot. The health lecture, which is given by a woman physician, is followed by a question box and preceded by a short program of music or other appropriate entertainment. Dr. Sara C. Buckley lectured on "Nature's Milestones," July 5; Dr. Alice I. Conklin, July 12, on "High Blood Pressure"; Dr. Julia C. Strawn, July 19, on "Safe Surgery"; Dr. Bertha Van Hoosen, July 26, on "Self-control." Future programs will be: August 2, "The Expectant Mother" by Dr. Effa V. Davis; August 9, "Mental Habits in Child Development," Dr. Josephine Young; August 16, "Feet," Dr. Anna E. Blount; August 23, "Adolescence," Dr. Lena K. Sadler, and August 30, "Treatment of the Common Cold," Dr. Alice K. Hall.

—Simple ceremonies marked the laying of the corner-stone of the new home of the Provident Hospital, June 14, which is the building formerly occupied by Chicago Lying-In Hospital, now being remodeled. In a cooperative program between the hospital and the University of Chicago, it is planned to develop this institution into a medical education center for Negroes. This program includes the care of the sick, clinical instruction for medical students, an increase in the number of internships for Negro physicians, graduate medical training, opportunities for Negro students for teaching and research. In 1930 a fund of $3,000,000 was subscribed for the development of this center. Provident Hospital, now at 16 West Thirty-Sixth Street, was founded in 1890 and has since been an important center for medical work among Negroes of the community. Rear Admiral Norman J.

Blackwood, medical corps, U. S. Navy, retired, has been appointed medical director.

—Beginning July 1, the Maxwell Street Dispensary of the Chicago Lying-In Hospital will be operated as a neighborhood maternity clinic, for a period of ten years. The dispensary will be known as the Chicago Maternity Center, and the lying-in hospital will continue to work in affiliation with it. The hospital had its beginning in the dispensary thirty-seven years ago, when Dr. Joseph B. De Lee, who is in charge of the hospital, founded it in four rooms of a tenement at Maxwell Street and Newberry Avenue. Since then the dispensary work has been carried on continuously. Hospital care is provided for homeless expectant mothers, but most of the work of the staff is done in the homes of the poor. Free nursing and medical service are furnished. The change in management was necessary because of lack of funds. As the closing of the institution would deprive women of the district of the proper care, it is hoped that sufficient funds will be procured to assure its continued operation. Dr. De Lee will continue as chief of the consulting staff.

—Dr. Meyer Solomon, associate in neurology, Northwestern University Medical School, was elected president of the Chicago Society for Personality Study, organized May 25. Other officers elected are Ernest W. Burgess, Ph.D., professor of sociology, University of Chicago, vice-president, and Dr. Paul L. Schroeder, professor and head of the department of criminology, University of Illinois College of Medicine, secretary. Charter members of the society include Harvey Carr, Ph.D., professor of psychology, University of Chicago; Dr. John Favill, associate clinical professor of neurology, Rush Medical College, and Robert H. Gault, Ph.D., professor of psychology, Northwestern University. It is the intention of the society to study human behavior and personality from all angles. Monthly meetings will bring together psychiatrists, psychologists, sociologists, anthropologists, educators, physiologists, biochemists, political scientists, criminologists and others concerned with advancement of the knowledge of personality. Problems to be studied will comprehend family situations, incompatibility, delinquency, the alcohol and drug habits, cerebral fatigue, constitutional make-up, and others. Membership will be limited to 100.

Deaths

Vernon Dee Brigham, Robinson, Ill.; University of Cincinnati College of Medicine, 1920; aged 39; died, May 17, at Elk City, Okla., of poison, self-administered.

Edward J. Brougham, Chicago; Chicago Medical College, 1887; a Fellow, A. M. A.; fellow of the American College of Surgeons; aged 66; on the staff of the Henrotin Hospital, where he died, June 15, of carcinoma of the tongue.

Otho Marion Ford, Rockford, Ill.; Chicago College of Medicine and Surgery, 1908; member of the Illinois State Medical Society; aged 51; died, June 14, of an overdose of morphine.

George S. Gfroerer, Oak Park, Ill.; College of Physicians and Surgeons, Chicago, 1885; a Fellow, A. M. A.; aged 73; died, July 5, in the Oak Park Hospital, of carcinoma of the stomach and chronic myocarditis.

Frederick O. Jackson, Bloomington, Ill.; Chicago Medical College, 1887; aged 73; died suddenly, May 30, at his summer home at Bass Lake, Ind., of cerebral hemorrhage.

Aloysius J. Lennon, Joliet, Ill.; College of Physicians and Surgeons, Chicago, 1901; a Fellow, A. M. A.; fellow of the American College of Surgeons; chief of the obstetric department, St. Joseph's Hospital, and surgeon to the Silver Cross Hospital; aged 54; died, July 7, of undulant fever.

Isaac S. Louis, Chicago; Northwestern University Medical School, Chicago, 1900; a Fellow, A. M. A.; aged 55; died, June 28, of cerebral hemorrhage.

Oren Judson Waters, Chicago; Jefferson Medical College, Philadelphia, 1891; member of the Illinois State Medical Society; fellow of the American College of Surgeons; assistant professor of (extramural) surgery, Northwestern University Medical School; on the staff of the Passavant Memorial Hospital; aged 74; died, June 25, in Milwaukee.

Jonathan Leaming Wiggins, San Diego, Calif.; St. Louis Medical College, 1877; member and past president of the Illinois State Medical Society and St. Clair County Medical Society; fellow of the American College of Surgeons; member of the Illinois Department of Registration and Education, 1919-1920; former member of the board of education of East St. Louis, Ill.; at one time on the staffs of the Deaconess Hospital and St. Mary's Hospital, East St. Louis; aged 77; died, May 28, of heart disease.

Harlow V. Wilson, Champaign, Ill.; Medical Department of Washington University, St. Louis, 1903; member of the Illinois State Medical Society; aged 56; was killed, June 27, when his automobile, under which he was working, fell on his chest.

Ulysses Grant Windell, Chicago; College of Physicians and Surgeons, Chicago, 1894; member of the Illinois State Medical Society; served during the World War; at one time medical inspector for the city board of health; formerly on the staff of the West Suburban Hospital, Oak Park, Ill.; aged 65; died, June 9, in the Edward Hines, Jr., Hospital, Hines, Ill., of bronchopneumonia.

Book Reviews

MEDICAL CLINICS OF NORTH AMERICA. (Issued serially, one number every other month.) Volume 16, Number 1. (Philadelphia Number—July, 1932.) Octavo of 290 pages with 75 illustrations. Per Clinic year, July, 1932, to May, 1933. Paper, $12.00; Cloth, $16.00 net. Philadelphia and London: W. B. Saunders Company, 1932.

The contributors to this number are Doctors Banks, Bockus, Campbell, Carey, Cooper, Devalin, Drant, Duncan, Farley, Fitz-Hugh, Jr., Gordon, George C. Griffith, Reynold S. Griffith, Jones Kalteyer, Kern, Krumbhaar, Ludy, Miller, Wm. T. Read, Jr., Rehfuss, Richardson, Rose, Stokes, Jr., Strecker, Stroud, Talley, Tocantins Wilson, Wohl, Wolferth, Wood.

MATERIA MEDICA, PHARMACOLOGY AND THERAPEUTICS: By Walter A. Bastedo, Ph. G., M. D., Sc. D., F. A. C. P., Assistant Clinical Professor of Medicine, Columbia University, Consulting Physician, St. Luke's Hospital, New York, St. Vincent's Hospital, Staten Island, and the Staten Island Hospital; President, United States Pharmacoloeial Convention, 1930-40. Third Edition, Reset. 739 pages with illustrations. Philadelphia and London: W. B. Saunders Company, 1932. Cloth, $6.50 net.

This work has gone through three editions in quite rapid successions, showing a remarkable demand for the work. The book is an adaptation, for the most part, of lectures delivered at Columbia University. Throughout the work the author has laid most stress upon those things that bear on practice, even to the exclusion of some matters of great interest to pharmacology. In this edition as in previous ones, the author has continued to emphasize such established facts, both laboratory and clinical, as have seemed of practical importance to the practicing physician.

LEAGUE OF NATIONS QUARTERLY BULLETIN OF THE HEALTH ORGANIZATION THE WORLD PEACE FOUNDATION. 40 Mt. Vernon St., Boston, Mass. Volume 1, Number 1, 1932. Geneva. Price per year, $2.00.

The Health Organization of the League of Nations has been in existence for ten years. Heretofore, those who wish to follow the health work of the League of Nations has been obliged to consult various documents and records of international conferences, the minutes of committee, report by experts, annual reports, etc. In the quarterly bulletin of which this is the first number all the data bearing on health matters is connected in book form and published quarterly.

ELECTROSURGERY: By Howard A. Kelly, M. D., LL.D., F. A. C. S., Baltimore, Maryland, and Grant E. Ward, M. D., F. A. C. S., Baltimore, Maryland. 305 pages with 382 illustrations by William P. Didusch and others. Philadelphia and London: W. B. Saunders Company, 1932. Cloth, $7.00 net.

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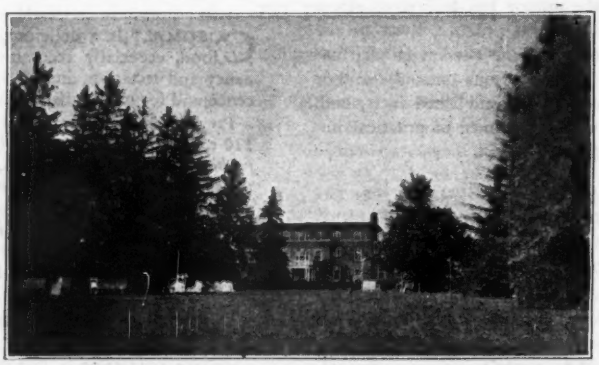

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